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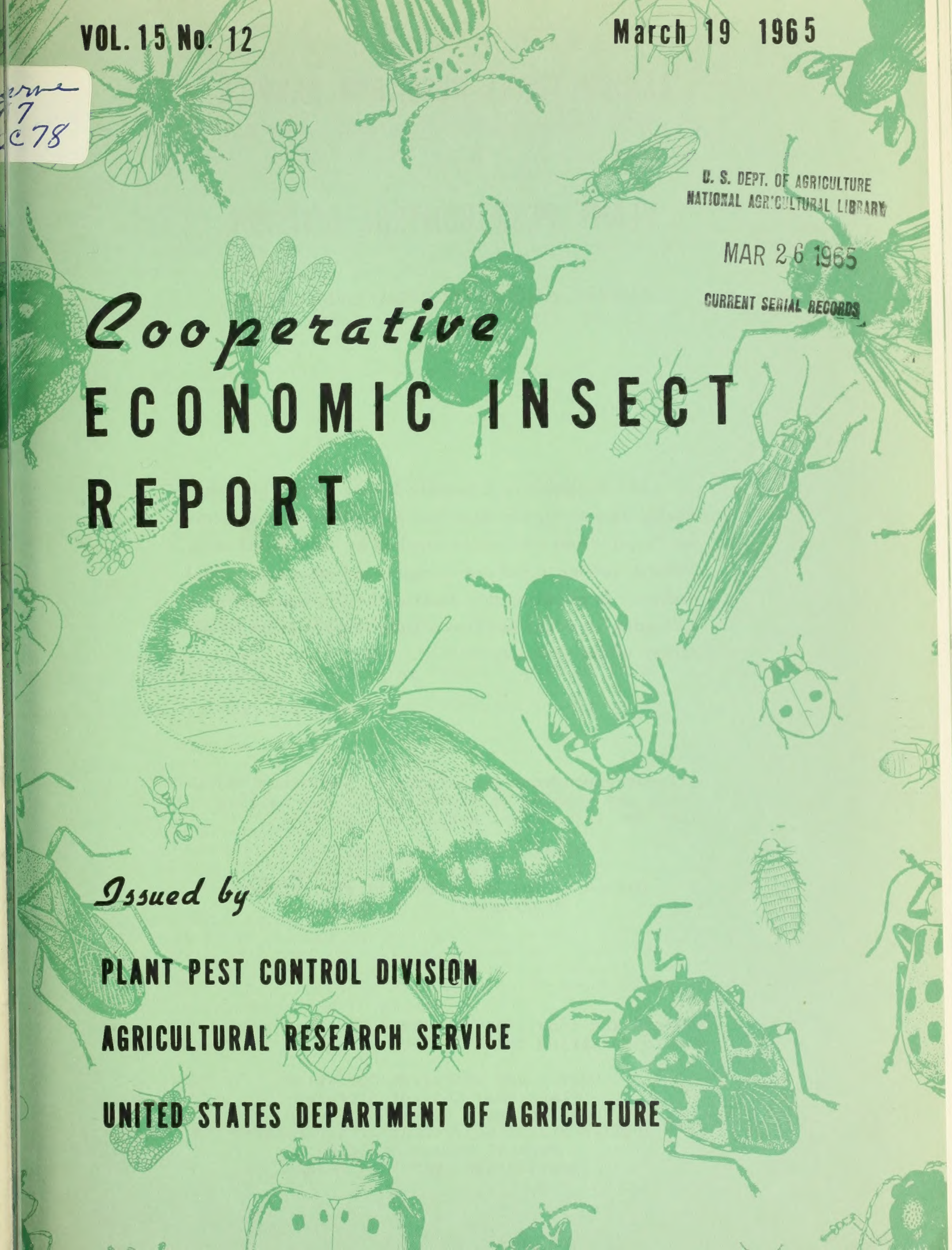

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 15 March 19, 1965 Number 12

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

ALFALFA WEEVIL larvae active in Delaware, Maryland and Georgia; controls urged in Georgia. First report of larval activity of CLOVER LEAF WEEVIL in Oklahoma. (p. 207).BROWN WHEAT MITE appears to be building up on small grains in Curry County, New Mexico. (p. 208).

PEAR PSYLLA egg laying very pronounced on Jackson County, Oregon, pear orchards. (p. 207). Additional light infestation of HALL SCALE found in Butte County, California; intensive survey underway. (p. 208).

PINE NEEDLE SCALE causing very noticeable needle drop on blue spruce in Fort Collins area, Colorado. (p. 210).

DETECTION

A LEAFHOPPER (Empoasca abrupta) collected for the first time in Delaware and in northeastern United States. HOLLY LEAF MINER collected for the first time in Lane County, Oregon. An ERIOPHYID MITE (Eriophyes gardeniella) collected for the first time in the United States at Lacoochee, Florida. (p. 210).

SPECIAL REPORTS

Status of the Screw-worm in the Southwest. (p. 211).

Estimated Losses and Production Costs attributed to Insects and Related Arthropods Attacking Wheat, Sorghum and Cotton (lint) in Texas. (p. 215-216).

Summary of Insect Conditions in the United States - 1964

- Fruit Insects
    - Pome Fruit Insects (p. 217)
    - Stone Fruit Insects (p. 222)
    - General Deciduous Fruit Insects (p. 225)
    - Nut Crop Insects (p. 229)
    - Grape Insects (p. 231)
    - Blueberry, Cranberry and Currant Insects (p. 232).
    - Citrus Insects (p. 235)
    - Olive, Avocado and Fig Insects (p. 235)

EUROPEAN APPLE SAWFLY poses a serious threat to fruit in New York. (p. 221). LESSER PEACH TREE BORER is rapidly becoming the primary pest of peaches in Indiana and is a serious pest of peaches in Michigan. (p. 222). ORIENTAL FRUIT MOTH is definitely established in the peach-growing area of Mesa County, Colorado. (p. 223). Fall migrants and oviparae of GREEN PEACH APHID numbers may result in larger population in spring of 1965. (p. 224). Hibernating population of PLUM CURCULIO in the Georgia Peach Belt is very light. (p. 224). Overwintering population of CODLING MOTH expected to be light in Missouri. (p. 227).

Reports in this issue are for the week ending March 12, unless otherwise indicated.

WEATHER OF THE WEEK ENDING MARCH 15

Spring was further delayed in many areas and particularly in the Southeast where cool and wet conditions continued. Precipitation was widespread and moderate in northern latitudes, widespread and light to moderate further north.

TEMPERATURE: This was another cold week in most of the Corn and Cotton Belts and in the Southeast. In the area from Louisiana and Arkansas eastward through the Carolinas and Florida this was the third consecutive week with temperatures averaging 6° to 9° below normal. Conditions were not only cool but wet, indicating a considerable retardation of spring progress and activity. Freezing extended to central Texas early in the week and to northern Florida later. Compared to the previous week, average temperatures rose sharply in Texas and in the area northward to the Canadian border but still averaged below normal except in southern Texas. In extreme southern Texas, weekly temperatures were 15° to 19° warmer than the previous week with daily highs in the 80's. Except for southern Texas, the only other above normal averages were in New England, 1° to 3° above but cooler than the previous week, and the northern tier of States from Oregon and Washington to the Dakotas, 1° to 3° above normal. Temperature patterns during the week were consistent with minor day to day changes.

PRECIPITATION: Rainfall was moderately heavy from southern California to New Mexico and parts of Texas and from Arkansas and Louisiana to the Carolinas and Florida. Precipitation elsewhere was widespread but light and in northern areas fell mostly as snow. Perhaps the driest area was in the Pacific Northwest and the northern Rockies. In Washington and Oregon it was the second sunny and dry week during what is still normally the rainy season; a most unusual situation.

SNOW: Snow cover lingered as far south as northern Missouri, in the Great Lakes area, and in the northern Appalachian area and northern New England with little reduction during the week. (Summary supplied by U.S. Weather Bureau).

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WEATHER BUREAU'S 30-DAY OUTLOOK

MID-MARCH TO MID-APRIL 1965

The Weather Bureau's 30-day outlook for mid-March to mid-April calls for temperatures to average below seasonal normals from the Mississippi Valley to the Pacific coast with greatest departures in the southern Rockies and the southern plateau. Above normal averages are expected in the Northeast, the Middle Atlantic States, and in Florida. Elsewhere near normal temperatures are in prospect. Precipitation is expected to exceed normal over the southern plateau and from the Rockies to the Appalachians except for near to below normal totals in the northern Rockies, northern Plains, and upper Mississippi Valley. Subnormal precipitation is anticipated over the North and Middle Atlantic Coast States as well as in Florida, while near normal amounts are expected in unspecified areas.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D. C. 20250. Price $5.00 a year.

CEREAL AND FORAGE INSECTS

GREENBUG (Schizaphis graminum) - NEW MEXICO - Light in small grain fields near Fort Sumner, De Baca County; Tucumcari, Quay County; and Grady and Clovis, Curry County. Most fields averaged less than one per linear foot with occasional heavier infestations. (N.M. Coop. Rpt.). TEXAS - Light (5-10 per foot of drilled row) on wheat in Delta County. (Turney). OKLAHOMA - Counts in wheat ranged 0-16 per linear foot; most fields checked averaged 3 or fewer per linear foot. Fields checked in Jackson, Cotton, Tillman, Kiowa, Comanche, Kingfisher, Logan, Payne and Okfuskee Counties. Field of oats and vetch in Garvin County averaged 6 per linear foot. (Okla. Coop. Sur.). ARKANSAS - Limited surveys in northwest area negative. (Ark. Ins. Sur.). GEORGIA - Light on small grains in northeast area. (Johnson, Mar. 9).

PEA APHID (Acyrthosiphon pisum) - ARIZONA - Populations continue on the increase; moderate to heavy in many alfalfa fields in Yuma, Maricopa and Pinal Counties. (Ariz. Coop. Sur.). NEW MEXICO - Extremely light in majority of alfalfa fields checked near Fort Sumner, De Baca County; moderate in 2 fields checked. (N.M. Coop. Rpt.). OKLAHOMA - Averaged 40 per square foot in overwintering alfalfa in Tillman County and 14 per linear foot in oats and vetch in Garvin County. (Okla. Coop. Sur.). ARKANSAS - No buildup found in northwest area legumes. (Ark. Ins. Sur.).

ENGLISH GRAIN APHID (Macrosiphum avenae) - OKLAHOMA - Averaged 100 per linear foot in wheat in Harmon County; counts in other southwestern counties ranged 0-15 per linear foot. Averaged 4 per linear foot in field of oats and vetch in Garvin County. (Okla. Coop. Sur.). ARKANSAS - Limited surveys negative in northwest area. (Ark. Ins. Sur.). MARYLAND - Light numbers present on developing small grains near Snow Hill, Worcester County. (U. Md., Ent. Dept.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - COLORADO - Noticeable numbers in Baca County alfalfa. (Schweissing). NEW MEXICO - Occasional light, spotted infestation noted in De Baca County alfalfa fields. (N.M. Coop. Rpt.).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Ranged 0-60 per linear foot in wheat checked in southwest; higher counts found in Tillman and Cotton Counties. (Okla. Coop. Sur.).

CORN LEAF APHID (Rhopalosiphum maidis) - ARIZONA - Slight increases found in small grains in Maricopa, Pinal and Yuma Counties; heaviest populations appear to be present in fields in boot stage. (Ariz. Coop. Sur.).

APHIDS - ALABAMA - Unidentified species appearing on oats in Tuscaloosa County; some losses reported. (Holstun). NEVADA - Heavy infestation of unidentified species on grain causing stunting and yellowing in the "Upper Muddy" area (Moapa), Clark County. (Peterson).

ALFALFA WEEVIL (Hypera postica) - GEORGIA - Infesting fields in northeast; 50-75 percent of plants showed feeding damage. First to third instars involved; up to 4 larvae per terminal noted. Controls urged. (Johnson, Mar. 9). MARYLAND - First and second instars active on new alfalfa growth in Snow Hill area, Worcester County, March 10. (U. Md., Ent. Dept.). DELAWARE - First instars present and feeding on new growth of alfalfa in area of New Castle County. (Burbutis, Mar. 9). MISSOURI - Surveys in southeastern district for eggs and/or larvae negative. (Jones). UTAH - Adults active on warmer days in northern alfalfa fields. (Knowlton, Mar. 9).

CLOVER LEAF WEEVIL (Hypera punctata) - OKLAHOMA - Larvae active in alfalfa in Blaine County; this is first report of activity this season. (Okla. Coop. Sur.). MARYLAND - Larvae light to moderate in alfalfa and clover fields in Prince Georges and Worcester Counties. (U. Md., Ent. Dept.).

WEEVILS (Hypera spp.) - ALABAMA - Second and third instars causing light damage on burclover leaves in Lee County. (McQueen). ARIZONA - H. brunneipennis larval counts continue increase in alfalfa fields of Yuma, Maricopa and Pinal Counties. Damaged terminals averaged 80 percent in infested fields. (Ariz. Coop. Sur.).

CLOVER ROOT CURCULIO (Sitona hispidula) - MARYLAND - Adults light in alfalfa in Snow Hill area, Worcester County. (U. Md., Ent. Dept.).

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - OKLAHOMA - Dry cornstalks checked in Okmulgee County 50 percent infested; field checked in Okfuskee County 10 percent infested. (Okla. Coop. Sur.). ILLINOIS - Survey in Alexander County revealed 2 living and 23 dead larvae or 8 percent survival. (Ill. Ins. Sur.).

EUROPEAN CORN BORER (Ostrinia nubilalis) - ILLINOIS - Surveys show 90 percent survival in Pulaski and Alexander Counties; some borers rather small but all appeared healthy. In Iroquois County, 70 percent of borers alive. (Ill. Ins. Sur.).

ARMYWORM (Pseudaletia unipuncta) - MARYLAND - Light numbers of small larvae found in small grain field near Snow Hill, Worcester County. (U. Md., Ent. Dept.).

CUTWORMS - MARYLAND - Light numbers of small larvae of undetermined species found in small grains near Snow Hill, Worcester County. (U. Md., Ent. Dept.).

LYGUS BUGS (Lygus spp.) - ARIZONA - Nymphs becoming numerous in alfalfa fields of Yuma, Maricopa and Pinal Counties. (Ariz. Coop. Sur.). UTAH - L. elisus and Lygus spp. active on alfalfa and mustard in Salt Lake and Weber Counties. (Knowlton, Mar. 9).

LEAFHOPPERS - ARIZONA - Empoasca spp. light to moderate; now appearing in alfalfa in Maricopa and Pinal Counties. (Ariz. Coop. Sur.). UTAH - Dikraneura carneola active on margins of dry farm wheat fields south of Granger, Salt Lake County. (Knowlton, Mar. 9).

BROWN WHEAT MITE (Petrobia latens) - NEW MEXICO - Appears to be building up in Curry County small grain fields; damage noticeable in several fields checked. (N.M. Coop. Rpt.). OKLAHOMA - Light in wheat in Harmon County. (Okla. Coop. Sur.).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Counts in wheat ranged 0-10 per linear foot in Kiowa, Tillman, Jackson, Cotton, Comanche, Logan, Kingfisher, Blaine, Payne and Okfuskee Counties. Mites present in 50 percent of fields checked. (Okla. Coop. Sur.).

FRUIT INSECTS

PEAR PSYLLA (Psylla pyricola) - OREGON - Egg laying on pear twigs in Jackson County very pronounced. (Larson).

GREEN PEACH APHID (Myzus persicae) - OREGON - Eggs hatched last week of February; now feeding on developing buds of apricots, peaches and pears in Jackson County. Pear growers still applying dormant sprays; early pink spray due in 10 days. (Berry).

HALL SCALE (Nilotaspis halli) - CALIFORNIA - Light population found on single small almond seedling. This is an extension of approximately 300 feet south of previously infested trees. This and other Prunus spp. are being destroyed. Intensive survey underway also. (Cal. Coop. Rpt.).

SAN JOSE SCALE (Aspidiotus perniciosus) - OREGON - Infestations on Jackson County fruit trees appear heavier than in 1963. (Larson).

YELLOW SCALE (Aonidiella citrina) - CALIFORNIA - Nymphs and adults heavy on citrus nursery stock in Durham, Butte County; medium in citrus in Sanger, Fresno County. (Cal. Coop. Rpt.).

SPIDER MITES - OREGON - Tetranychus telarius (two-spotted spider mite) and Eotetranychus carpini borealis (yellow spider mite) moving into developing buds of pears in Jackson County orchards. (Larson). NEW MEXICO - Bryobia rubrioculus eggs very light on fruit trees checked in 2 orchards at Bent, Otero County, and Hondo, Lincoln County. No eggs noted on apple trees checked at Fort Sumner, De Baca County. (N.M. Coop. Rpt.).

EUROPEAN RED MITE (Panonychus ulmi) - OREGON - Eggs seem to be more numerous this year on all varieties of pears in Jackson County. (Larson).

PEAR RUST MITE (Epitrimerus pyri) - OREGON - Moving from overwintering quarters in bark scales to developing buds in Jackson County pear orchards. (Larson).

PECAN NUT CASEBEARER (Acrobasis caryae) - TEXAS - Overwintering larvae locally heavy in hibernacula in Brazos County pecan orchards. (Randolph).

PECAN WEEVIL (Curculio caryae) - TEXAS - Soil examinations indicated heavy populations of grubs in Kimble County pecan orchards. Ranged up to 12 per cubic foot of soil. (Van Cleave, Storey, Hancock).

TRUCK CROP INSECTS

POTATO PSYLLID (Paratrioza cockerelli) - ARIZONA - Light, mostly eggs and nymphs, on lycium plants in Deer Valley and Goodyear area of Maricopa County. (Ariz. Coop. Sur.).

STRAWBERRY ROOT APHID (Aphis forbesi) - MARYLAND - Eggs heavy with some hatching found on stems and leaves of strawberries in small plantings at Snow Hill, Worcester County. Light numbers of Pentatrichopus sp. also present on leaves. (U. Md., Ent. Dept.).

APHIDS - CALIFORNIA - Sappaphis foeniculus and Myzus persicae (green peach aphid) medium on carrots in Holtville, Imperial County. (Cal. Coop. Rpt.). ARIZONA - M. persicae increasing populations found in lettuce fields in Yuma and Maricopa Counties and sugar beet fields in Maricopa and Pinal Counties. (Ariz. Coop. Sur.).

CABBAGE LOOPER (Trichoplusia ni) - FLORIDA - Caused light damage to 5 percent of celery plants in commercial planting at Sanford, Seminole County. (Desin, Mar. 9). ARIZONA - No increase found in lettuce fields in Maricopa and Yuma Counties during past week. (Ariz. Coop. Sur.).

A LEAF MINER FLY (Liriomyza sp.) - FLORIDA - Caused light damage to 100 percent of 200 celery plants 26 inches high in commercial plantings at Sanford, Seminole County. (Desin, Mar. 9).

A SPIDER MITE (Tetranychus sp.) - MARYLAND - Adults light on old leaves of strawberries in planting near Salisbury, Wicomico County. (U. Md., Ent. Dept.).

BROWN WHEAT MITE (Petrobia latens) - CALIFORNIA - Medium on carrots in Holtville, Imperial County. (Cal. Coop. Rpt.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

DOUGLAS-FIR BEETLE (Dendroctonus pseudotsugae) - OREGON - Noted emerging 1 month earlier than usual in Coast Ranges of western part of State. (Rudinsky).

NANTUCKET PINE TIP MOTH (Rhyacionia frustrana) - ARKANSAS - Adults active in southeastern section. (Warren).

PINE NEEDLE SCALE (*Phenacaspis pinifoliae*) - COLORADO - Heavy infestation and very noticeable needle drop on blue spruce in Fort Collins area, Larimer County. (Thatcher).

A CONIFER SAWFLY (*Neodiprion taedae linearis*) - ARKANSAS - Adults active in southeast. (Warren).

SPRING CANKERWORM (*Paleacrita vernata*) - MISSOURI - Small numbers of adults attracted to lights in Columbia, Boone County. (Houser).

A LEAFHOPPER (*Koebelia californica*) - CALIFORNIA - Nymphs and adults, probably this species, locally heavy on pine trees in Santa Cruz County. (Cal. Coop. Rpt.).

A LEAFHOPPER (*Empoasca abrupta*) - DELAWARE - Adults rather numerous and active on snapdragons in Newark, New Castle County, during December 1964. Collected by D. F. Bray. Det. by J. P. Kramer. This new State record is the first report from the northeastern United States. (Burbutis).

APHIDS - ARIZONA - *Hysteroneura setariae* (rusty plum aphid) continues heavy on roses and other ornamentals in Phoenix area, Maricopa County. *Macrosiphoniella sanborni* (chrysanthemum aphid) found on ornamentals in Yuma, Maricopa, Pinal and Pima Counties. (Ariz. Coop. Sur.). CALIFORNIA - *Capitophorus shepherdiae* light to medium on *Franseria dumosa* in Seeley, Imperial County. *Lachnus salignus* heavy locally on willow trees in Madera, Madera County. (Cal. Coop. Rpt.). OREGON - *Aphis abietina* (spruce aphid) increased during warm weather; heavy on ornamental spruce in Multnomah County. (Nicolaison). OKLAHOMA - *Cinara tujafilina* moderate on arborvitae in Garvin County and light in Payne County. An unidentified species is damaging crocus in Payne County. (Okla. Coop. Sur.). FLORIDA - All stages of *Hysteroneura setariae* light on leaves of bird-of-Paradise (*Strelitzia reginae*) at Salerno, Martin County. (Campbell, Feb. 3). This is a new host record for the Florida Division of Plant Industry. (Fla. Coop. Sur.).

HOLLY LEAF MINER (*Phytomyza ilicis*) - OREGON - Found in Eugene, Lane County, on yard plantings of holly. This is a new county record. Other known infestations are Portland area, Multnomah County and Astoria, Clatsop County. (Larson).

COCCIDS - FLORIDA - *Diaspis echinocacti* (cactus scale) all stages severe on leaves of 3 Christmas cactus plants for sale in store at Holly Hill, Volusia County. Plants destroyed. (Pott, Feb. 3). *Cerococcus* sp. all stages light on 425 *Hibiscus* sp. in nursery at North Miami (Hickman, Feb. 3). Adults moderate on stem of 20 percent of 500 *H. rosa-sinensis* in nursery at Miami, Dade County, (McFarlin, Feb. 4). *Pseudaonidia duplex* (camphor scale) all stages localized on leaves of *Photinia glabra* in nursery at Tallahassee, Leon County. (Miller, Feb. 1). ALABAMA - *Unaspis euonymi* (euonymus scale) heavy and very damaging on dwarf euonymus and *Fiorinia theae* (tea scale) light to medium on Burford holly in Ozark, Dale County. (McQueen). CALIFORNIA - *Toumeyella liriodendri* (tuliptree scale) nymphs and adults heavy locally on deciduous magnolia in San Jose, Santa Clara County. *Kermes quercus* (an oak kermes scale) medium on live oak in Lompoc, Santa Barbara County. *Aulacaspis rosae* (rose scale) heavy locally on rose plantings in San Jose, Santa Clara County. *Lepidosaphes machili* (an armored scale) occurring on cymbidium growing stock in nursery in La Mesa San Diego County. *Parlatoria pittospori* (an armored scale) heavy locally on bottlebrush in park in San Diego, San Diego County. *Pulvinaria floccifera* (possibly this species) adults heavy on trunk and roots of lantana plants in park in San Diego, San Diego County. *Aspidiotus hederae* (oleander scale) heavy locally on acacia trees in Yuba City, Sutter County. (Cal. Coop. Rpt.).

AN ERIOPHYID MITE (*Eriophyes gardeniella* Keifer) - FLORIDA - Adults collected from gardenia at Lacoochee, Pasco County. (O'Berry, Jan. 24). Det. by H. H. Keifer. This is a new United States record. Described from Mexico City, Mexico. (Fla. Coop. Sur.).

SPIDER MITES (*Tetranychus* spp.) - ALABAMA - Present on boxwood and extremely heavy on *hollies and pyracanthas* at Ozark, Dale County. (McQueen). CALIFORNIA - *T. pacificus* (Pacific spider mite) heavy on native yucca plants in Chula Vista, *San Diego County*. (Cal. Coop. Rpt.).

A TARSONEMID MITE (*Hemitarsonemus latus*) - FLORIDA - Eggs found on leaves of 5 *Cissus* sp. in *plastic greenhouse* at Apopka, Orange County. (Van Pelt, Feb. 10).

EUROPEAN EARWIG (*Forficula auricularia*) - UTAH - Encountered in home gardens in Salt Lake-Holladay area, Salt Lake County. (Knowlton, Mar. 9).

INSECTS AFFECTING MAN AND ANIMALS

HOG LOUSE (*Haematopinus suis*) - OKLAHOMA - Heavy on hogs in Osage County. (Okla. Coop. Sur.).

LONG-NOSED CATTLE LOUSE (*Linognathus vituli*) - OKLAHOMA - Heavy on cattle in Osage and Pawnee Counties. (Okla. Coop. Sur.).

STATUS OF THE SCREW-WORM (*Cochliomyia hominivorax*) IN THE SOUTHWEST

No screw-worm cases were reported during the period March 7-13 in the United States. The Republic of Mexico reported 19 screw-worm cases: Sonora 11, Tamaulipas 4 and one each in Chihuahua, San Luis Potosi, Nuevo Leon and Durango. Total sterile screw-worm flies released: Texas 2,726,250 and Mexico 49,856,000.

	Positive Cases		Negative Cases		Ratio of Positive Cases to 100 Cases Negative	
Year	Current	Cumulative	Current	Cumulative	Current	Cumulative
Table 1.	Comparison of specimens reported during corresponding weeks in 1963 and 1964 in Southwestern Eradication Area.					
1963	15	159	46	243	32.60	65.43
1964	1	1	85	368	1.17	.27
1965	0	4	31	468	0.00	.85
Table 2.	Comparison of specimens reported during corresponding weeks and in a corresponding area in 1964 in the United States-Mexico Barrier Zone.*					
1964	1	130	16	138	6.25	94.20
1965	17	412	17	267	100.00	154.30
Table 2A.	Mexican portion of Barrier Zone only.					
1964	0	125	0	44	0.00	284.09
1965	17	410	9	163	188.88	251.53

* Barrier Zone - Area in which screw-worm eradication operations are being carried out to prevent establishment of self-sustaining screw-worm populations in the United States. (Anim. Dis. Erad. Div.).

COMMON CATTLE GRUB (*Hypoderma lineatum*) - OKLAHOMA - Light in north central section; most grubs *have left cattle* to pupate. (Okla. Coop. Sur.).

CLUSTER FLY (Pollenia rudis) - COLORADO - Extremely abundant and annoying around homes at Yampa, Routt County. (Hantsbarger).

A BLACK FLY (Simulium sp.) - CALIFORNIA - Adults heavy and attacking humans and pets, particularly dogs, in Big Sur, Monterey County. Infestations developed during past year and are now locally severe. (Cal. Coop. Rpt.).

CHICKEN MITE (Dermanyssus gallinae) - WISCONSIN - Heavy infestation confirmed from Dane County location. (Wis. Ins. Sur.).

HOUSEHOLD AND STRUCTURAL INSECTS

CARPET BEETLES - INDIANA - Larvae of Attagenus piceus (black carpet beetle) medium in home in Goodland, Newton County. (Frishman). Adults of Anthrenus verbasci (varied carpet beetle) annoying in home in Columbus, Bartholomew County. (Sanders). OKLAHOMA - Anthrenus scrophulariae (carpet beetle) reported from several homes in Stillwater area, Payne County. (Okla. Coop. Sur.).

A DERMESTID BEETLE - MARYLAND - Larvae of undetermined species found in mouse bait in home at Williamsport, Washington County. (U. Md., Ent. Dept.).

CIGARETTE BEETLE (Lasioderma serricorne) - TEXAS - Locally heavy in homes in Brazos County. (Randolph). ALABAMA - Concern continues; presently most damaging to carpets, tapestries, furniture and other products in Mobile County. (Seibels et al.).

BROWN SPIDER BEETLE (Ptinus clavipes) - ALABAMA - Unusual infestation in Butler County home; appearing under rugs, on chairs and generally over the house. Reported in several other counties also. (Speed et al.). MARYLAND - Adults annoying in home at Poolesville, Montgomery County. (U. Md., Ent. Dept.).

A LEAF BEETLE (Trirhabda flavolimbata) - COLORADO - Nuisance in several locations in Larimer County; reported particularly in mountain areas. (Hantsbarger).

CLOVER MITE (Bryobia praetiosa) - DELAWARE - Several infestations occurred in homes in New Castle and Kent Counties. (MacCreary). NEVADA - Entering homes in large numbers in southern Washoe County. (Coop. Rpt.). MARYLAND - Numerous and annoying in home at Rockville, Montgomery County. (U. Md., Ent. Dept.).

WINTER GRAIN MITE (Penthaleus major) - TEXAS - Light numbers entering homes and causing concern in Montague County. (Turney).

A LEAFHOPPER (Keonolla confluens) - NEVADA - Entering homes in large numbers in southern Washoe County. (Coop. Rpt.).

TWO-SPOTTED STINK BUG (Perillus bioculatus) - DELAWARE - Causing nuisance in at least 2 homes in New Castle County. (MacCreary).

A CLOTHES MOTH (Tineola sp.) - MARYLAND - Larvae found in clothes drawer in home at Linthicum Heights, Anne Arundel County. (U. Md., Ent. Dept.).

SOUTHERN LYCTUS BEETLE (Lyctus planicollis) - COLORADO - Apparently emerging from newly laid oak flooring in new home in Larimer County. (Thatcher).

A CERAMBYCID BEETLE - INDIANA - Larvae emerged in home from chest of drawers in Rushville, Rush County. (Sanders).

BLACK CARPENTER ANT (Camponotus pennsylvanicus) - MISSOURI - Nuisance in home in Columbia, Boone County. (Houser).

SUBTERRANEAN TERMITES (Reticulitermes spp.) - OKLAHOMA - Reported swarming in Oklahoma County. (Okla. Coop. Sur.).

STORED-PRODUCT INSECTS

CIGARETTE BEETLE (Lasioderma serricorne) - TEXAS - Locally heavy on stored cottonseed in Hidalgo County. (Texas Coop. Rpt.; Strong). ALABAMA - Feeding in small lot of cottonseed stored in Lee County. (Seibels et al.).

CARPET BEETLE (Anthrenus scrophulariae)- ALABAMA - Larvae destroyed all fishing lures made with chicken feathers in a tackle store in Mobile County; more than 150 salt-water lures were complete loss. (Seibels).

A DARKLING BEETLE (Tribolium destructor) - CALIFORNIA - Adults and larvae medium in stored products in courthouse at Santa Barbara, Santa Barbara County. (Cal. Coop. Rpt.).

GRAIN MITE (Acarus siro) - DELAWARE - Heavy in mixture of grain and litter on farm in New Castle County. Det. by D. Larson. (Burbutis).

BENEFICIAL INSECTS

A BIG-EYED BUG (Geocoris decoratus) - UTAH - Active in wheat fields and roadside grasses at Granger, Salt Lake County. (Knowlton, Mar. 9).

MISCELLANEOUS INSECTS

A SNAKE MITE (Ophionyssus natricis) - FLORIDA - Adults taken from Indian python and boa constrictor in museum at Gainesville, Alachua County. (Weaver, Feb. 3).

CORRECTIONS

CEIR 14(22):556 - SPIDER MITES - FLORIDA - Oligonychus perditus should read Oligonychus ununguis (spruce spider mite). O. perditus is not known to occur in the United States.

CEIR 15(11):171 - Under EUROPEAN CORN BORER - Line 5 should read: ... by Sympiesis viridula (a eulophid) and Horogenes punctorius (an ichneumon).

LIGHT TRAP COLLECTIONS

	Temperature °F.	Precipitation (inches)	Type of trap *	Agrotis ipsilon (black cutworm)	Carpocapsa pomonella (codling moth)	Chorizagrotis auxiliaris (army cutworm)	Estigmene acrea (salt-marsh caterpillar)	Faronta diffusa (wheat head armyworm)	Feltia subterranea (granulate cutworm)	Heliothis virescens (tobacco budworm)	H. zea (bollworm, corn earworm, tomato fruitworm)	Loxostege commixtalis (alfalfa webworm)	Loxostege similalis (garden webworm)	Loxostege sticticalis (beet webworm)	Ostrinia nubilalis (European corn borer)	Peridroma saucia (variegated cutworm)	Prodenia ornithogalli (yellow-striped armyworm)	Protoparce quinquemaculata (tomato hornworm)	Protoparce sexta (tomato hornworm)	Pseudaletia unipuncta (armyworm)	Spodoptera exigua (beet armyworm)	Spodoptera frugiperda (fall armyworm)	Trichoplusia ni (cabbage looper)	Crops **
FLORIDA																								
Gainesville 3/10			BL						1											6				
SOUTH CAROLINA																								
Charleston 3/8-14	34-64	0.95	BL	2			0		2	0	0					0	0	0	0	5		0	0	
TENNESSEE																								
Cumberland County 3/2-8				3					8							2	2			16			4	
TEXAS																								
Brownsville 3/1-8	38-85	0	5 BL	34					267		32					63	4			280		29	2	
Waco 3/6-12			BL	3			0		10	0	0					18	16			20	0	0	0	

* BL = blacklight; I = incandescent; MV = mercury vapor; O = other

** alf. = alfalfa; beet = garden beet and/or sugar beet; cole = cole crops (crucifers); cott. = cotton; FC = field corn; grain = small grains; leg. = legumes (unspecified); lett. = lettuce; pean. = peanut; pepp. = pepper; pot. = potatoes; SC = sweet corn; sol. = solanaceous plants (unspecified); soy. = soybean; TC = truck crops (unspecified or mixed); tob. = tobacco; tom. = tomato.

IN Texas DURING 1964
(State or District) (Year)

ATTACKING Wheat
(Commodity or Crop)

A. Pest or pest complex: Greenbug, winter grain mite, brown wheat mite, fall armyworm, armyworm

B. Number of acres[a] produced (From CRS) No. 3,017,000

C. Average yield per acre[a] (From CRS) Units/ 20.5 bu.

D. Price[b] per unit (bu.)[c] (From CRS) $/ 1.55

E. Acres[a] needing control No. 300,000

F. Acres[a] treated No. 150,000

G. Reduction due to not treating where needed:

H. Loss in yield, percent % 10

I. Loss in yield, units per acre[a], C x H Units/ 2.05 bu.

J. Loss in yield, $ per acre[a], D x I $/ 3.78

K. Loss in quality, $ per ----[a] $/ ----

L. Yield loss for all acres[a], (E-F) x I Units 307,500 bu.

M. Control cost, $ per acre[a], $/ 1.00

N. Control cost for all acres[a], F x M $ 150,000.00

O. Yield loss for all acres[a], (E-F) x J $ 567,000.00

P. Quality loss for all -----[a], (E-F) x K $ ----

Q. Combined control cost and losses, N + O + P $ 717,000.00

R. Percent loss due to each insect in the complex:

Comment: Drought resulted in higher than normal abandonment as 3,017,000 acres were harvested out of 4,002,000 planted; however, yields were 2 bu. above yields a year earlier. Insects caused light to moderate widespread damage with some heavy local damage occurring.

a. Acres, head of cattle or other producing units used by Crop Reporting Service.

b. Season average price per unit as given by CRS (describe basis).

c. Bushels, boxes, tons or other marketing units used by CRS; show which in ( ).

Submitted by M. V. Meisch

Date January 18, 1965

ATTACKING Sorghum
(Commodity or Crop)

A. Pest or pest complex: Sorghum midge, corn earworm, sorghum webworm, sugarcane borer, chinch bug

B. Number of acres[a] produced (From CRS) No. 4,906,000

C. Average yield per acre[a] (From CRS) Units/ 44 bu.

D. Price[b] per unit (bu.)[c] (From CRS) $/ 1.06

E. Acres[a] needing control No. 2,500,000

F. Acres[a] treated No. 1,500,000

G. Reduction due to not treating where needed:

H. Loss in yield, percent % 25

I. Loss in yield, units per acre[a], C x H Units/ 11.0 bu.

J. Loss in yield, $ per acre[a], D x I $/ 11.66

K. Loss in quality, $ per ----[a] $/ ----

L. Yield loss for all acres[a], (E-F) x I Units 11,000,000 bu.

M. Control cost, $ per acre[a], $/ 2.00

N. Control cost for all acres[a], F x M $ 3,000,000

O. Yield loss for all acres[a], (E-F) x J $ 11,660,000

P. Quality loss for all ----[a], (E-F) x K $ ----

Q. Combined control cost and losses, N + O + P $ 14,660,000

R. Percent loss due to each insect in the complex:

Comment: Seed treatment data not included. Sorghum midge damage was considerably lighter and less widespread than in 1963.

a. Acres, head of cattle or other producing units used by Crop Reporting Service.

b. Season average price per unit as given by CRS (describe basis).

c. Bushels, boxes, tons or other marketing units used by CRS; show which in ( ).

Submitted by M. V. Meisch

Date January 18, 1965

ESTIMATED LOSSES AND PRODUCTION COSTS ATTRIBUTED TO INSECTS AND RELATED ARTHROPODS

ATTACKING Cotton (lint) (Commodity) IN Texas (State or District) DURING 1964 (Year)

A. Pest or pest complex: Aphids, spider mites, thrips, fleahoppers, tobacco budworm, bollworm, pink bollworm, cabbage looper, boll weevil

B. Number of acres [a] produced (From CRS) No. 5,675,000

C. Average yield per acre [a] (From CRS) Units/ 349 lbs.

D. Price[b] per unit (lb.)[c] (From CRS) $/ 28.9

E. Acres [a] needing control No. 4,500,000

F. Acres [a] treated No. 3,500,000

G. Reduction due to not treating where needed:

H. Loss in yield, percent % 25

I. Loss in yield, units per acre [a], C x H Units/ 87.25 lbs.

J. Loss in yield, $ per acre [a], D x I $/ 25.22

K. Loss in quality, $ per acre [a] $/ 1.00

L. Yield loss for all acres [a], (E-F) x I Units 87,250,000 lbs.

M. Control cost, $ per acre [a] $/ 6.00

N. Control cost for all acres [a], F x M $ 21,000,000.00

O. Yield loss for all acres [a], (E-F) x J $ 25,220,000.00

P. Quality loss for all acres [a], (E-F) x K $ 1,000,000.00

Q. Combined control cost and losses, N + O + P $ 47,220,000.00

R. Percent loss due to each insect in the complex:

Comment: These losses do not include loss from disease. A two-month drought from mid-June to mid-August caused heavy abandonment of dryland cotton in the southern high plains and decreased yields in low plains and blacklands.

a. Acres, head of cattle or other producing units used by Crop Reporting Service.

b. Season average price per unit as given by CRS (describe basis).

c. Bushels, boxes, tons or other marketing units used by CRS; show which in ( ).

Submitted by M. V. Meisch

Date January 18, 1965

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1964

(continued from page 204)

FRUIT INSECTS

POME FRUIT INSECTS

Highlights:

In 1964 various MITES, particularly SPIDER MITES, caused the greatest concern to apple and pear orchardists. The Great Lakes States of Michigan, Ohio, Indiana and Illinois reported that EUROPEAN RED MITE was the most important arthropod pest of apples. This spider mite was a major pest of apples in North Carolina, Maryland and Arkansas, was difficult to control in Delaware and New York, and was generally troublesome in areas of Maine. The more western States frequently reported various species of Tetranychus as their major apple pest. CODLING MOTH was generally kept under control in most of the Nation's pear and apple orchards; only unsprayed or poorly sprayed orchards suffered any loss. Lepidopterous pests in general were not a problem in orchards. The few exceptions where losses occurred on treated trees were localized. APHIDS developed early but in general, controls were effective. APPLE APHID was persistent in Maine and WOOLLY APPLE APHID has become a problem in Alabama and New Mexico, however. PEAR PSYLLA continued as a problem in northern California and it appears to be an increasing problem in New England States. BEETLES were of little consequence in most States; an infestation of BROAD-NECKED ROOT BORER threatened a major commercial orchard in Rhode Island and severely injured trees in 2 Massachusetts orchards. EUROPEAN APPLE SAWFLY increased in abundance in western Massachusetts; damage to early flowering cultivars was noticeable in some apple orchards.

EUROPEAN RED MITE (Panonychus ulmi) was responsible for more spraying and monetary expenditures for chemical control than any other plant-feeding arthropod in MICHIGAN during the 1964 season. Apples and plums were attacked most, although pears and other fruit trees in some locations were infested to a lesser degree. Populations built up in June and peaked at 30 mites and 60 eggs per leaf in Kalamazoo County research plots during the week of July 13. High populations continued in many commercial orchards until mid-August when cool temperatures slowed mite activity. A warming trend in early September led to considerable hatch and populations were again high in Michigan during mid-September. Overwintering eggs began to hatch in Wooster, Wayne County, OHIO, on April 17; peak occurred from April 27 to May 4. These dates are about average for the area. European red mite was of more concern in 1964 than it was in 1963 and it was the major pest on apples. Some growers controlled it effectively through the season. Infestations of this spider mite built up in a number of orchards the first part of July and some orchards had threating populations the first half of June. The first hatch of overwintered eggs in the Vincennes area of Knox County, INDIANA, occurred on April 6. Populations began an immediate buildup and continued to be quite persistent through September in many instances. European red mite is now considered to be the primary arthropod pest of apples in Indiana. European red mite and other mites were the major pest problem on apples in the State of ILLINOIS. European red mite reached high populations before the end of May in southern Illinois and continued to increase in numbers all through the season. Populations reached very high numbers, sometimes exceeding 200 per leaf.

European red mite is still rated as one of the most troublesome pests of commercial apples in the mountain counties of NORTH CAROLINA; populations were moderate in 1964. In northern VIRGINIA, European red mite was a pest of apples. This spider mite caused conspicuous bronzing in several commercial orchards of MARYLAND during the 1964 season where it is the major problem in apple orchards in the State. While most apple pests in DELAWARE were under excellent control, some difficulty in control of European red mite was encountered in many orchards. Late infestations and buildups during August and September in NEW YORK were noted in several Champlain Valley orchards where heavy deposition of mite eggs on calyx end of apples occurred. Weather was favorable for mite buildup during August and September. Lack of acaricide pressure on mites during this period was considered a contributing factor. Hatch of European red mite in MAINE began May 8-10 in central areas of the State. Eggs of the first summer generation were reported from several areas by May 27-29. Populations were well into the second generation by mid-June and females of this generation were found in some locations in late June. Activity was variable through the summer; heavy increases were observed in Monmouth, Androscoggin County, on untreated apple foliage in early August. European red mite was generally troublesome where early populations were permitted to reproduce unhampered.

European red mite was a pest of apples and other fruit trees in many locations in CALIFORNIA and it was one of the more serious pests of apples in ARKANSAS in 1964.

TWO-SPOTTED SPIDER MITE (*Tetranychus telarius*) is considered one of the most serious pests of apples and pears in COLORADO at the present time. There were occasional flareups in some orchards which became a serious problem to a few apple growers where extended spray intervals were used. Management of the cover crops becomes important in control of buildups in orchards. Loss to apples in Colorado was 1-2 percent with some afteraffects on the trees. This was not so much a problem on pear orchards as in previous years. Two-spotted spider mite was controlled with the normal 4 cover sprays in Colorado. In KANSAS, two-spotted spider mite caused apple foliage to bronze in the Witchita and Manhattan areas of the central part of the State. This mite caused only slight damage in northeast Kansas. Mite control is now the number one problem of most Kansas fruit growers.

FOUR-SPOTTED SPIDER MITE (*Tetranychus canadensis*) continued to predominate in some ILLINOIS apple orchards, but two-spotted spider mite reached damaging populations in many orchards as it had in 1963. High populations of SPIDER MITES occurred very early in June and continued throughout the season. An increasing number of fruit growers applied control measures while mite populations were quite low and prevented damage from occurring even in this severe season.

SPIDER MITE infestations were heavy in immature stages in untreated apple orchards of Yakima County, WASHINGTON, by late May. All stages were abundant in frost-damaged, neglected orchards in late July. The first larvae and protonymphs of *Bryobia rubrioculus* (a fruit-tree mite) were active on apples in late April in Whitman County, 3 weeks later than normal. PACIFIC SPIDER MITE (*Tetranychus pacificus*) was a pest of pear and other fruits locally in CALIFORNIA.

Two-spotted spider mite and SCHOENE SPIDER MITE (*Tetranychus schoenei*) were pests of apples in some areas of VIRGINIA. *Tetranychus* spp. were a general problem on apples in most sections of the State of MARYLAND throughout the season.

APPLE RUST MITE (*Aculus schlechtendali*) was recorded for the first time in the State of OHIO when it was collected in Wayne County in July. Several orchards in NEW YORK in the Marlboro-Middle Hope area of Ulster and Orange Counties were seriously infested by eriophyid mites tentatively identified as apple rust mite. The mites were first noted in the area in 1963, but injury, presumably caused by them, had been observed for several years previously. Controls were effective. Apple rust mite was observed in a 12 to 13-year-old orchard at Peru, Clinton County, New York, for the first time in 1964. Several infestations occurred in Orange County.

PEAR RUST MITE (*Epitrimerus pyri*), like apple rust mite, was recorded for the first time in OHIO. Collections were made in Wayne and Ashtabula Counties. Pear rust mite disappeared from Yakima Valley orchards of WASHINGTON which were infested in 1963. This eriophyid mite was recorded in the Wenatchee area for the first time.

PEAR LEAF BLISTER MITE (Eriophyes pyri) was heavy and caused damage in Greene, Androscoggin County, MAINE, on May 15. Heavy infestations and moderate damage were observed on Golden Delicious apples in Wilton, Franklin County, on May 19. In COLORADO, this eriophyid mite was extremely light in pear orchards and very few specimens were noted in any of the orchards when it was found. No treatments were used in any of the pear-growing areas for control of pear leaf blister mite. The pear crop was extremely heavy in Mesa, Montrose, Delta and Garfield Counties and undersized fruit was the main problem that confronted the grower. Pear leaf blister mite caused approximately normal damage in UTAH and lighter than normal damage in CALIFORNIA.

MITES were more troublesome to apple growers in GEORGIA than were insects, but caused only minor losses because of effective control measures. Damage to apples in UTAH was generally moderate in Washington County orchards.

CODLING MOTH (Carpocapsa pomonella) damage to Delicious apples was noted at packing sheds in the Rio Hondo Valley of NEW MEXICO. During early September, fruit ranged 10-80 percent "wormy" from the Rio Hondo Valley while those in the Espanola Valley ranged 1-25 percent "wormy." Light to heavy losses also occurred in apple orchards in the Fort Sumner area, De Baca County, New Mexico. Codling moth was kept well under control on apples and pears in COLORADO with a few more "stings" and entries on apples due to the longer spray intervals and reduced number of sprays. The overall loss of apples was light and was estimated at 2-6 percent. Most pear growers used an average of 4 cover sprays. Four cover sprays were posted in most of the areas which coincide with the apple sprays. Loss of pears was light in Colorado and estimated at 2-3 percent. Activity was light throughout the season in KANSAS and caused little concern among commercial growers. Unsprayed Jonathan apple check trees in a commercially sprayed orchard near Wathena, Doniphan County, had 84 percent of the fruit infested with third-generation larvae at harvest. Codling moth was of minor concern to apple growers in INDIANA who followed recommended control procedures during 1964.

First-brood codling moth injury which had not been troublesome for several years in NEW YORK was extremely difficult to find in well-sprayed orchards. Late in the season, a few growers in all parts of the State reported injury on pears and occasionally on apples. In any case, it was not a serious problem in New York's commercial plantings. Infestations in MARYLAND during the 1964 season were generally light and caused little damage in commercial apple orchards.

EYE-SPOTTED BUD MOTH (Spilonota ocellana) infestations in southwestern MAINE were light and damage was light to negligible in mid-May. No reports of a summer generation were noted. Population was somewhat below the 1963 level in Maine. In NEW YORK, eye-spotted bud moth was collected in numbers in the Hudson Valley and another olethreutid moth, ORIENTAL FRUIT MOTH (Grapholitha molesta), caused very little injury to quince in New York. There were several instances of injury to apples in INDIANA by oriental fruit moth.

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) egg masses were difficult to find on apple trees in March and April in KANSAS. The infestations remained light all through the season and little injury was found at the cooperative packing plant in Wathena, Doniphan County, during harvest. The northeast area of Kansas is the only place in the State where this leaf roller moth has become established. Populations were again low in commercial apple orchards of MARYLAND; however, larvae of another leaf roller moth, FRUIT-TREE LEAF ROLLER (Archips argyrospilus) were common in unsprayed apple orchards in the Hancock area of Washington County. Both red-banded leaf roller and fruit-tree leaf roller were pests of apples in northern VIRGINIA. Infestations of fruit-tree leaf roller varied from light to heavy on apples in southern Washoe County, NEVADA, during June.

YELLOW-NECKED CATERPILLAR (Datana ministra) caused severe defoliation of apple trees at Valley City in Barnes County, NORTH DAKOTA, and RED-HUMPED CATERPILLAR (Schizura concinna) defoliated unsprayed apple trees in western PENNSYLVANIA.

BROWN-TAIL MOTH (*Nygmia phaeorrhoea*) infestations were located in several NEW HAMPSHIRE towns where they were found mainly in abandoned or neglected apple orchards. During the spring of 1964, a total of 1,861 hibernation webs were cut. Other lepidopterous pests of pome fruit included UNSPOTTED TENTIFORM LEAF MINER (*Callisto geminatella*) in NEW YORK which was noted in one experimental block but it did not persist into the next brood in the Hudson Valley. This leaf blotch miner was also found on fruit in MISSOURI. APPLE BARK BORER (*Thamnosphecia pyri*) was collected in numbers in New York's Hudson Valley and a LYONITIID MOTH (*Bucculatrix pomifoliella*) was markedly abundant in that valley but only in unsprayed orchards. CLIMBING CUTWORMS (*Eupsilia* spp.) were much more numerous than normal throughout OHIO where a black-faced species was quite common on apple and other fruit trees.

CANKERWORMS caused considerable leaf feeding on apples and crab apples in eastern NORTH DAKOTA and FALL WEBWORM (*Hyphantria cunea*) was observed feeding on apple foliage in that State. APPLE-AND-THORN SKELETONIZER (*Anthophila pariana*) continued to defoliate unsprayed trees in western WASHINGTON. WESTERN TENT CATERPILLAR (*Malacosoma pluviale*) was found on a crab apple tree shipped into ALASKA, but it is not believed that this infestation will survive as the tree was heavily sprayed.

APPLE APHID (*Aphis pomi*) was somewhat earlier than usual in MAINE. Winged migrants and several young were observed on Red Delicious apples on June 1 in Monmouth, Kennebec County. Numbers were generally low throughout the State during early and mid-June with moderate populations reported from Wilton, Franklin County, and Monmouth. Heavy infestations were noted in Alfred, York County, in mid-June and very heavy populations were present in Monmouth at that time. Reports from other areas indicated very heavy buildup in all sections with strong populations throughout Maine well into August. Appreciable parasitism was noted in the central area, but predation was light to moderate with plant bugs and flower fly larvae in principal roles. Lady beetles were conspicuously absent in Maine on apple aphid infestations. Colonies built up on water sprouts during the summer in some apple orchards in MICHIGAN but injury was considered of little consequence. Apple aphid was light in all apple orchards checked in COLORADO and required no additional sprays.

ROSY APPLE APHID (*Anuraphis rosea*) was active on apples in northern VIRGINIA during the 1964 season. This aphid was observed in numbers in a few orchards in the commercial apple-growing section of western MARYLAND. Rosy apple aphid and APPLE GRAIN APHID (*Rhopalosiphum fitchii*) were light in all apple areas of COLORADO and few controls were needed specifically for these aphids.

WOOLLY APPLE APHID (*Eriosoma lanigerum*) was moderate to heavy in many orchards in San Juan, Santa Fe and Rio Arriba Counties, NEW MEXICO. In ALABAMA, this aphid continued to be of major importance in newly established apple orchards in the Piedmont section, especially in Coosa and Tallapoosa Counties. Unspecified APHIDS began hatching on apple trees in early April in MASSACHUSETTS and large populations built up in June.

PEAR PSYLLA (*Psylla pyricola*) was not so damaging in central WASHINGTON as it was in 1963. This was due in part to the general applications of postharvest sprays through prebloom spray and the dry, windy weather in May which killed many nymphs. Populations in Clark County in early summer were heavy, but not until after harvest in central Washington. Pear psylla continued a problem on pears in northern CALIFORNIA. Egg hatch was largely completed in southwestern MICHIGAN by the week ending May 15. Sprays kept this psyllid under control in all but a few commercial orchards. Some resistant populations were reported in Michigan in 1964. Activity was about normal in NEW YORK and there were no reports of serious injury where spray programs were maintained. Pear psylla was more important in home orchards than in commercial orchards in CONNECTICUT. Observations in the field and the number of specimens submitted indicate some buildup on individual trees in RHODE ISLAND; there are practically no commercial pear orchards in the State. Overwintered pear psylla adults were present on twigs in early April in MASSACHUSETTS and a few eggs were deposited by April 10. The first hatching was observed April 30. Most infestations in Massachusetts were easily controlled.

SAN JOSE SCALE (Aspidiotus perniciosus) infested 2 commercial apple orchards in MARYLAND in the Hancock area of Washington County. Oil sprays will be required in 1965 for control.

TARNISHED PLANT BUG (Lygus lineolaris) was much more abundant in MASSACHUSETTS than usual on fruit buds of apple early in the season. Warm weather during and prior to bloom increased the amount of injury. This plant bug dimpled many fruits, especially Delicious apple cultivars. Although injury caused by PLANT BUGS was fairly prevalent on unsprayed pears and apples throughout NEW YORK, losses seemed to be insignificant. Plant bugs injured apples in OHIO and although damage was considered of minor concern, an unusual amount of injured apples was noted.

Adults of a PERIODICAL CICADA (Magicicada septendecim) appeared in apple orchards and timberlands in KANSAS along the Missouri River bluffs in Doniphan County north and west of Wathena about May 23. Emergence was at a peak by June 3 with injury apparently light in most orchards. One young apple planting north of Blair showed many damaged or broken twigs by August 15.

PLUM CURCULIO (Conotrachelus nenuphar) injury to apples was higher in MASSACHUSETTS in 1964 than it had been in several years. Unusually warm weather in May greatly increased activity and as many growers had not applied a cover spray at that time, considerable injury resulted. Heavy injury occurred May 22-25. Injury to apples was considerably higher in western Massachusetts. Some serious injury occurred in unsprayed apples in OHIO but very minor damage was found in sprayed orchards. A single adult of APPLE CURCULIO (Tachypterellus quadrigibbus) was jarred from an unsprayed apple tree in Kingston, Washington County, RHODE ISLAND, on May 27.

BROAD-NECKED ROOT BORER (Prionus laticollis) infestation threatened the existence of a major commercial orchard in RHODE ISLAND at Glocester, Providence County. Identification was confirmed by Dr. D. M. Anderson. This cerambycid beetle also damaged a crab apple tree in Richmond, Washington County. Adults were collected in Burrillville and Johnston, Providence County, Rhode Island, on July 20. Broad-necked root borer was damaging in at least 2 orchards in MASSACHUSETTS, with about 5 percent of the trees in one young planting severely injured and some trees killed. Another CERAMBYCID BEETLE (Oberea sp.) was noted in VIRGINIA on apple trees locally.

An adult of APPLE MAGGOT (Rhagoletis pomonella) was taken on June 26 in MAINE from infested Wealthy apples and first emergence from McIntosh apples occurred June 30. Peak emergence was reached July 17; adult numbers declined steadily from that date and activity ceased on August 17. Control was generally excellent throughout Maine with only a few problems. Infestations were observed in several unsprayed apple orchards in MARYLAND in the Hancock area of Washington County. A moderate to heavy infestation of a CECIDOMYIID MIDGE (Dasyneura mali), a leaf-curling species, was noted in Turner, Androscoggin County, MAINE, in late June.

EUROPEAN APPLE SAWFLY (Hoplocampa testudinea) continued its increase in abundance in western MASSACHUSETTS for the second consecutive year. Apples in some orchards were noticeably damaged, especially early blooming cultivars. In NEW YORK, the distribution of European apple sawfly is more or less static; however, it still poses a serious threat to fruit as indicated by observation of unsprayed trees. Damage to commercial blocks was very slight owing to the spray program followed. European apple sawfly has not yet been found in the Champlain Valley nor in western New York. Skeletonized leaves of pear and cherry trees in a few orchards near Albuquerque, NEW MEXICO, were attributed to a SAWFLY, possibly Caliroa cerasi (pear-slug).

FLOWER THRIPS (Frankliniella tritici) was very abundant in the spring in ILLINOIS and is believed to cause a dimple on apple fruit; this condition has been abundant for the past several years.

STONE FRUIT INSECTS

Highlights:

LESSER PEACH TREE BORER was the major pest of peaches in Michigan and perhaps in Indiana and Illinois, while PEACH TREE BORER was the major pest of this crop in Georgia; in Alabama these two aegeriid moths are considered as equal pests of peaches. A related pest, Sanninoidea sp., seriously weakened or killed peach trees in several New Mexico counties. Other lepidopterous larvae were in general well controlled in the Nation; one exception appears to have been ORIENTAL FRUIT MOTH in Washington. Several other peach-growing States reported that larvae of this olethreutid moth were serious or caused twig or tip injury, however. GREEN PEACH APHID may be expected to be heavy in the spring of 1965 on peaches in Massachusetts and some control difficulty with this aphid was experienced in Pennsylvania in 1964. Other aphids were heavy locally but apparently did not present any unusual problems on stone fruits. WHITE PEACH SCALE was a considerable problem in part of the Georgia Peach Belt. CATFACING INSECTS including GREEN STINK BUG and PLANT BUGS were local problems on peach orchards. PLUM CURCULIO was the most important insect problem in the sandhills of North Carolina on peaches. Other peach-producing areas of the Nation generally reported good control on well-sprayed trees. SPIDER MITES on stone fruits required controls in every State reporting.

LESSER PEACH TREE BORER (Synanthedon pictipes) infestations were severe on plums in NORTH DAKOTA at Wyndmere, Richland County, and Mandan, Morton County. This clearwing moth continued to be a major pest on peach trees in ILLINOIS. Populations had increased considerably in some orchards after the 1963 season in which very little spraying was done. Moth emergence was observed in Illinois as early as May 1. Economic damage in INDIANA was quite prevalent and heavier than in past years. Adult emergence began in April and continued into October. Lesser peach tree borer is rapidly becoming the primary peach problem in Indiana. First overwintering larvae in OHIO pupated and emerged as adults on May 15-18 with peak emergence about June 19-26. Lesser peach tree borer was generally present in a number of peach orchards but only a few orchards had heavy infestations in Ohio. General adult emergence was underway in MICHIGAN from Berrien to Grand Traverse Counties the second week of June. Peak emergence in Oceana County research plots occurred in early July. A few moths were still emerging the second week of September. This clearwing moth is the most serious insect pest of peaches in Michigan and injury is widespread even though considerable expenditure for control is made. Lesser peach tree borer injury was rather heavy in some GEORGIA peach orchards although the general infestation was somewhat lighter than that of a year when there is more winter injury and more dead and dying trees.

PEACH TREE BORER (Sanninoidea exitiosa) and lesser peach tree borer were, as usual, the most destructive pests of peach trees in ALABAMA. Infestations of peach tree borer were very heavy in some GEORGIA peach orchards in 1964 as they were in 1963. It continued to cause considerable damage in many peach orchards. The general infestation continued heavier than that of an average year. Peach tree borer continued as the number one peach problem in Georgia. Peach tree borer was numerous in the sandhills area of NORTH CAROLINA in late June. Peach growers in that area regularly apply insecticides for control. In KANSAS, larvae were found in 50-80 percent of the peach trees examined while being dug from unsprayed nursery rows during November. Most of the borers were from one-quarter to one-half inch long. There is no indication of an increase in damage in bearing peach orchards in Kansas sprayed for control. Peach tree borer continues to be a problem in new peach orchards of ARKANSAS. Spraying of trunks in established orchards is an effective practice and holds numbers low. In NEW MEXICO, larvae of Sanninoidea sp. seriously weakened or killed peach trees in both dooryard and commercial plantings in Bernalillo, Sandoval, San Juan, Rio Arriba and Valencia Counties.

ORIENTAL FRUIT MOTH (Grapholitha molesta) larvae infesting fruits caused very few problems in commercial peach orchards of southwestern MICHIGAN. Better spray programs during recent years have greatly reduced losses caused by this olethreutid moth. Fruit and terminal injury in OHIO in commercial peach orchards seemed to be unusually low and relatively light injury to fruit was observed in unsprayed orchards. The first adults of the 1964 season were collected April 27 in INDIANA. Activity in peach orchards continued for the remainder of the season. Oriental fruit moth was found in a few ILLINOIS peach orchards but it was mostly well controlled. As usual, in MISSOURI, considerable twig injury on terminals of peaches occurred but most growers sustained no damage to fruit. Oriental fruit moth caused less injury to peach fruit in Missouri than it had for several years but tip injury in unsprayed young orchards was severe. This olethreutid moth became definitely established in part of the peach-growing area of Mesa County, COLORADO, and intensive work in delineating the area by bait traps was conducted. From the bait-trap records, an intensive spray program was underway in the affected area in an effort to reduce the initial population level. Adults were taken all during the season in bait traps; however, only a small number of larvae entered the fruit. A survey made of fruits during the harvest season in Colorado showed a loss of 1-2 percent; however, in another year this could change considerably. Oriental fruit moth was a serious pest of late peaches in CALIFORNIA. Larvae of this moth caused moderate flagging injury to peaches in early June in the lower Yakima Valley of WASHINGTON, and adults were observed by late June. Oriental fruit moth was much more abundant than normal by August and difficult to control.

Oriental fruit moth caused very little injury to peaches in NEW YORK in 1964 although there was some third-brood injury late in the season, particularly in western New York. Growers were able to obtain good control by following warnings which were issued. In PENNSYLVANIA, oriental fruit moth was more serious on peaches than it had been for several seasons. Terminal injury to peaches was noted early in the season in MARYLAND and during July in the Hancock area of Washington County. Overall infestations during the season were generally light in Maryland, especially in well-sprayed orchards. Oriental fruit moth occurred throughout ALABAMA on peaches and plums but the extent of damage to fruit is questionable.

PEACH TWIG BORER (Anarsia lineatella) larvae were numerous in 2 young peach plantings in Doniphan County, KANSAS, in April. Over 50 percent of the tips were infested. In COLORADO peach orchards, larvae of this gelechiid moth were light and caused 2-3 percent loss. Better control was attributed to the increased number of sprays used by growers for oriental fruit moth control. Young larvae of peach twig borer began penetrating peach and apricot terminals in WASHINGTON in late April. This was 2 weeks later than normal. Larvae were boring into green apricot fruits by early May in Whitman County.

Several other lepidopterous pests of stone fruits reported in 1964 include: CARPENTERWORM (Prionoxystus robiniae) which damaged winter-injured cherry trees in Yakima County, WASHINGTON, and WESTERN TUSSOCK MOTH (Hemerocampa vetusta) which was locally damaging to prunes in a few CALIFORNIA locations. FALL WEBWORM (Hyphantria cunea) larvae were observed feeding on plums and chokecherry in NORTH DAKOTA. Populations of climbing CUTWORMS (Eupsilia spp.) were much higher than normal throughout OHIO where they were quite common on cherry, plum and peach trees. CIGAR CASEBEARER (Coleophora serratella) were numerous on cherry at Newport, Newport County, RHODE ISLAND, in late July.

GREEN PEACH APHID (Myzus persicae) was quite abundant on peaches in PENNSYLVANIA and in some instances did not respond to treatments. Fall migrants and oviparae were much more abundant than usual in MASSACHUSETTS on peaches; this could result in large populations in the spring of 1965. Overwintering egg counts of green peach aphid made during the winter of 1963 in COLORADO showed 80-percent reduction over that of the previous year on peaches. This reduction indicated that there should have been a light population level in the spring of 1964. All areas checked in Colorado confirmed this prediction. BLACK CHERRY APHID (Myzus cerasi) was locally heavy in both RHODE ISLAND and CALIFORNIA. APPLE APHID (Aphis pomi) occurred on prunes in Sonoma County, CALIFORNIA.

WHITE PEACH SCALE (Pseudaulacaspis pentagona) was present in some orchards in the GEORGIA Peach Belt and quite abundant in peach orchards at Barney, Brooks County, where it caused considerable damage in some orchards. Summer sprays have proved to be ineffective against this scale insect in Georgia. In TEXAS, white peach scale occurred on peaches in the central, northeastern and north central areas; however, infestations were generally light. A flareup of GRAPE MEALYBUG (Pseudococcus maritimus) occurred in the lower Yakima Valley of WASHINGTON.

Deformed and gnarled peaches were not unusually prevalent in GEORGIA. These, in some cases, were due to special sprays for STINK BUGS, COREID BUGS and TARNISHED PLANT BUG (Lygus lineolaris) control. CATFACING INSECTS were not a problem in commercial peach orchards of MARYLAND. Tarnished plant bug was much more abundant than usual on fruit buds of peaches early in the season in MASSACHUSETTS. Warm weather during and prior to bloom increased the amount of damage. HICKORY PLANT BUG (Lygocoris caryae) and L. quercalbae continued to plague one peach orchard in the Amherst area of Massachusetts. Some plant bug injury was observed in OHIO peach orchards. GREEN STINK BUG (Acrosternum hilare) injury caused over 50 percent of the fruit to be culled in a peach orchard near Blair in northeastern KANSAS. Lygus spp. were well controlled in COLORADO by following the recommended spray programs. CATFACING BUGS attacked peaches and plums over a wide area of TEXAS.

PLUM CURCULIO (Conotrachelus nenuphar) second brood emerged in the sandhills peach-growing area of NORTH CAROLINA in late June. This is the most important peach insect problem in North Carolina. Infestations in GEORGIA peaches were very light in 1964 as they have been in the 4 previous years. Plum curculio was practically absent in some peach orchards and the general infestation is now the lightest ever in more than 40 years of observation by one reporter. New insecticides and more efficient spraying equipment, together with better spray schedules, are largely responsible for this reduced infestation. The hibernating population of adults in the Georgia Peach Belt in the winter of 1964-65 is very light. The production of quality peaches in ALABAMA is impossible without proper control of this weevil. Moderate to heavy infestations developed on untreated plums in central and southern LOUISIANA in 1964.

Plum curculio has caused little injury to commercially produced fruits in KANSAS for several years. The fruits on 4 unsprayed peach trees in Wathena, Doniphan County, were heavily infested with second-generation larvae in August. The first larvae to leave dropped plum fruit in Wooster, Wayne County, OHIO, were noted on June 12. Summer-brood adults began to emerge on Independence Day, but very minor damage was found in unsprayed orchards. Some serious injury occurred on unsprayed cherries in Ohio. The first adults of the season in MICHIGAN were jarred from stone fruit in Livingston County on May 5, which is earlier than usual. Good spray programs kept injury in commercial orchards low in Michigan.

SHOT-HOLE BORER (Scolytus rugulosus) damaged dooryard and commercial peach trees in NEW MEXICO. Dooryard plantings were injured at Tucumcari, Quay County, and commercial peach orchards in Sandoval, Rio Arriba, Santa Fe, Bernalillo and San Juan Counties. Light, local attacks of DRIED-FRUIT BEETLE (Carpophilus hemipterus) on peaches were reported in Denton County, TEXAS, and occasional light feeding by JAPANESE BEETLE (Popillia japonica) was observed on plums and cherries at Wooster, Wayne County, OHIO.

BLACK CHERRY FRUIT FLY (Rhagoletis fausta) adults emerged in MICHIGAN on May 25 in Kent County and at Kingsley, Grand Traverse County, on May 31. This is the earliest known emergence record for this fruit fly in northern Michigan. CHERRY MAGGOT (Rhagoletis cingulata cingulata) was practically nonexistent in OHIO in 1964 following heavy bird depredation to cherries in 1963 and the unusually heavy cherry crop in 1964. Cherry maggot was very numerous in wild cherries in RHODE ISLAND from July into September and adults were caught on sticky board traps. Surveys in CALIFORNIA, for the western subspecies, Rhagoletis cingulata indifferens, continued in the eradication project in Siskiyou and Humboldt Counties. Locally, a few adults were trapped and only 2 properties showed larval infestations. Eradication treatment was applied in all suspect cases.

EUROPEAN RED MITE (Panonychus ulmi) was again the most severe problem on peaches and apples in NEW JERSEY and many regularly sprayed orchards had bronzed foliage in September. European red mite mainly attacked plums and apples in MICHIGAN, although cherries, peaches and pears in some locations were infested to a lesser degree. Populations built up in June and peaked at 30 mites and 60 eggs per leaf in Kalamazoo County research plots during the week of July 13. A warming trend in early September led to considerable hatch and populations were again high in mid-September in Michigan. European red mite was a pest of prunes and other trees in many locations in CALIFORNIA and PACIFIC SPIDER MITE (Tetranychus pacificus) was locally a pest on peaches and other fruits in that State. TWO-SPOTTED SPIDER MITE (Tetranychus telarius) was well controlled with the spray programs for peaches in COLORADO. This spider mite caused peach foliage to bronze in the Wichita and Manhattan areas of KANSAS; mites were more difficult to control than in previous years. Two-spotted spider mite was one of the more serious pests of peaches in ARKANSAS. PEACH SILVER MITE (Aculus cornutus) was well controlled in COLORADO, but unspecified MITES were more damaging to peaches than to apples in Washington County, UTAH.

GENERAL DECIDUOUS FRUIT INSECTS

EUROPEAN RED MITE (Panonychus ulmi) winter eggs hatched in late April in Yakima County, WASHINGTON, 2 weeks later than normal. This spider mite was more abundant and/or damaging than normal in UTAH. European red mite appears occasionally in northeastern KANSAS where a few were found in 2 orchards near Wathena in May but no injury was noted. Despite heavy numbers of overwintering eggs in MISSOURI, good control was obtained over the State. European red mite was troublesome in some areas of MINNESOTA, but responded to early treatment in PENNSYLVANIA. Overwintering eggs ranged light to moderate in NEW YORK. The early season development of this mite was generally slow, but the warm, dry weather in June and July was very favorable for rapid buildup later. When inadequate controls had been applied, heavy populations could be found in late June, July and early August. Failures in obtaining satisfactory control with oil applied in the pink and later sprays can be attributed largely to inadequate spray coverage. No conclusive evidence of resistance to any recommended acaricide was noted in New York as many growers had adequate seasonal control with prebloom applications of oil or an acaracide followed with a supplemental acaricide spray in late June or July. European red mite increased in CONNECTICUT in 1964 and warm, dry weather in August caused population increases in MASSACHUSETTS. European red mite was troublesome in some VERMONT orchards this season.

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) was well up in trees on an earlier than average date in MAINE although light to moderate in most locations; it caused problems from mid-July on. Late-season populations increased noticeably in NEW HAMPSHIRE and required special spray applications in some orchards. Two-spotted spider mite populations were generally below the usual levels in most MASSACHUSETTS orchards, but were again high in CONNECTICUT. Generally, two-spotted spider mite was not a problem in NEW YORK, although late in the season it could be found in most orchards where its presence was either masked by heavier populations of European red mite or where serious populations did not develop.

Buildup of two-spotted spider mite on weed hosts during the summer in New York's Champlain Valley and the dry weather encouraged migration into trees. Two-spotted spider mite populations were high but spotty on susceptible fruits in MICHIGAN. Sprays directed mainly against European red mite generally kept this mite reduced. Generally, only a few very light infestations of two-spotted spider mite occurred in OHIO. This mite became active in early April in INDIANA and continued to be a pest through September. However, populations were not so troublesome as those of European red mite. Two-spotted spider mite was troublesome in some MINNESOTA areas and was active on various fruits over NORTH DAKOTA. Two-spotted spider mite adults were in tops of fruit trees in WASHINGTON early and first eggs hatched in early May in the Yakima area. Two-spotted spider mite damaged many deciduous fruit trees throughout CALIFORNIA.

SPIDER MITES were one of the most prevalent fruit pests in NEVADA. Tetranychus spp. were serious in orchards when not controlled in NEW MEXICO in Hundo Valley, Lincoln County; Velarde, Rio Arriba County; Farmington-Aztec area of San Juan County; and in the Corrales and Sandoval areas of Sandoval and Bernalillo Counties. In LOUISIANA, Tetranychus spp. developed heavy populations in some fields in Livingston and Tangipahoa Parishes. In general, MITES were not unusually abundant in GEORGIA in 1964 and controls were required in very few instances. Mite populations were lower than usual in CONNECTICUT through August, but the peak population appeared later than usual. Undetermined mites were severe on most deciduous fruit crops in CALIFORNIA.

APPLE MAGGOT (Rhagoletis pomonella) activity was unusually late in NEW HAMPSHIRE and problems were appreciably less in VERMONT than over the past 3 years. Drought in most of MASSACHUSETTS resulted in poor adult emergence but damaging numbers occurred in some eastern area orchards. Adults of apple maggot were caught on sticky board traps in RHODE ISLAND. It was under control in most commercial orchards and there were fewer complaints from home growers than in 1963 in Rhode Island. Apple maggot continued abundant in CONNECTICUT home orchards and was present in normal numbers in NEW YORK in the Hudson Valley but presented no unusual problems. In western New York, growers in a few scattered orchards, and some canners, reported a slight increase in the amount of injury. This injury was generally attributed to overextending the interval between applications during the critical period and to stopping the spray program too early in the season. Over the past several years, maggot activity seemed to extend later in the season than previously. Apple maggot was the most frequent and serious problem identified in home and other noncommercial plantings in New York. Apple maggot appears to be the number 2 problem on apples in northern NEW JERSEY; however, this fly is found in all parts of the State. Apple maggot was again a problem in PENNSYLVANIA where controls were not used.

Apple maggot flies emerged in very low numbers or none at all in some places in MINNESOTA. The warm, dry weather and the resultant dry, hard ground apparently interfered with emergence in some localities. Populations were relatively low in WISCONSIN; this could be attributed in a great part to the lack of rainfall. Apple maggot was generally well controlled in northern ILLINOIS but damage was high on unsprayed and neglected trees. Adults emerged earlier and persisted later in the season than noramlly in MICHIGAN. General emergence began June 22 in southern counties and latest collections were made from sticky board and experimental Frick traps in Ingham County during the week of September 23. Owing to good spray programs, few commercial problems were experienced in Michigan. Adults were first trapped in northeastern OHIO on June 12 and in southern Ohio the first week of June. Both records seem to be much earlier than usual. Although a few small commercial orchards reported serious damage, the majority of orchardists in Ohio had no problems with this pest.

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) was a minor problem in some locations in NEW JERSEY but it was not a threat to any grower. Injury was practically absent in the Hudson Valley of NEW YORK. In western New York, this leaf roller moth was extremely difficult to find during the first brood. Where some second-brood activity was observed, growers were able to bring this pest under control before serious injury occurred. Red-banded leaf roller was at lower levels in New York's Champlain Valley than it had been in the past. Populations were low for the second straight year in MASSACHUSETTS. This leaf roller moth was not found in RHODE ISLAND, and only light infestations were reported in MAINE from Upper Gloucester and Standish, Cumberland County, in early June. Larvae were in the first instar at that time. Moderate populations were reported in Cumberland, Cumberland County, in late June when larval development ranged first to third instars; damage was light. By mid-June, appreciable first and third-brood damage was found in several orchards in southwestern Maine.

Red-banded leaf roller problems were practically nonexistent in MICHIGAN nor were they of concern to OHIO growers in 1964, and populations remained low in ILLINOIS. Red-banded leaf roller was found on fruits in MISSOURI. It was abundant in Door County orchards of WISCONSIN in early June with second-brood adults noted July 3 and some larval feeding reported from Sheboygan County in mid-August. Damage was not very extensive in MINNESOTA owing to low populations.

FRUIT-TREE LEAF ROLLER (Archips argyrospilus) was locally damaging to deciduous fruit trees in several widely separated areas of CALIFORNIA. It was collected on fruits in MISSOURI and appeared again in southern and western ILLINOIS but caused little damage. Populations were reportedly high in the Door County area of WISCONSIN. The second-brood adult flight occurred in that area the last week of June. Fruit-tree leaf roller was more numerous than usual in CONNECTICUT, and this species and OBLIQUE-BANDED LEAF ROLLER (Archips rosaceanus) were collected in numbers in the Hudson Valley of NEW YORK.

CODLING MOTH (Carpocapsa pomonella) was lighter in ARKANSAS in 1964 than it was in 1963. This pest was first noted in central and southeastern MISSOURI on May 18 and was troublesome late in the season. Overwintering populations are expected to be high in Missouri. Emergence of the first brood was very rapid in ILLINOIS during warm weather but was well controlled. However, continued warm weather in late season again revealed the ability of codling moth to survive at very low numbers and then demonstrate a rapid increase. A number of orchardists over Illinois were surprised during early harvest with a sudden appearance of new entries. There was essentially little difference between 1963 and 1964 at Madison, WISCONSIN. Damage was not very extensive in MINNESOTA in 1964 owing to low populations. Adult codling moth emergence of the spring brood began May 16 in MICHIGAN in Van Buren County cages. Heavy emergence occurred May 22-26 which is earlier than usual. First larval entries were observed on June 8. General, widespread emergence of second-brood moths in southern and central Lower Peninsula counties of Michigan started July 20; well-timed sprays kept commercial problems low. The first adults of the season emerged at Wooster, Wayne County, OHIO, May 8-12 with a peak about May 15-22, but injury was no problem in most orchards.

Codling moth was generally light throughout MAINE but damage was somewhat higher than usual. Eggs hatched from June 8 through August 27 in NEW HAMPSHIRE, but no peak was denoted. Problems in VERMONT were appreciably fewer than those encountered over the previous 3 years. A significant increase was noted on unsprayed trees in CONNECTICUT. Codling moth was collected in numbers in the Hudson Valley of NEW YORK and at lower numbers in the Champlain Valley. Codling moth was difficult to find in well-sprayed commercial orchards of NEW JERSEY; however, it was plentiful in unsprayed trees. Pupation began April 8 in Yakima County, WASHINGTON, and the second generation started in late July. Codling moth was a continuing problem on deciduous fruits in CALIFORNIA.

ORIENTAL FRUIT MOTH (Grapholitha molesta) infestations were heavier in GEORGIA than those of 1963 or of an average year. This moth was collected in numbers in the Hudson Valley of NEW YORK and was more numerous than usual in CONNECTICUT. Oriental fruit moth was lighter in ARKANSAS but required treatments.

LEAF BLOTCH MINERS (Lithocolletis spp.) were heavy in southern GEORGIA with L. caryaefoliella probably the species involved. In NEW YORK, L. blanchardella was markedly abundant in the Hudson Valley and very abundant in some orchards in Columbia County in the spring, at the time of the overwintering-brood flight, but the second brood failed to develop damaging populations. L. blanchardella which became a control problem in the Calhoun County area of ILLINOIS during the past 2 seasons, was not a problem in 1964.

EASTERN TENT CATERPILLAR (Malacosoma americanum) was widely distributed on various fruit trees in central TEXAS, with the 1964 infestation equal to those of 1962 and 1963. It was quite destructive in localized areas of Texas. Malacosoma spp. were damaging to deciduous fruit trees in a few CALIFORNIA locations. First hatch of Malacosoma sp. was about May 3 in San Juan County, WASHINGTON, and heavy infestation occurred on fruit trees and other plants by late May in Clark County. FALL WEBWORM (Hyphantria cunea) was common in northeastern OKLAHOMA in September but caused little damage. First webs were noted in Dougherty County, GEORGIA, April 15; infestations were light to heavy, but mostly moderate. PEACH TWIG BORER (Anarsia lineatella) damage was general in Washington County, UTAH, and a continuing problem on CALIFORNIA deciduous fruits all year.

Various CUTWORMS caused greater than usual injury during late May in MICHIGAN and continued damaging through mid-June. Light to serious injury was reported from many counties of both the Upper and Lower Peninsulas of Michigan. Climbing species damaged fruit. A NOCTUID MOTH (Catocala sp.) occurred generally over TEXAS following the same pattern as in 1963.

ROSY APPLE APHID (Anuraphis rosea) was somewhat heavier than usual in MAINE, with appreciable populations reported at locations in York, Franklin and Kennebec Counties. Neither rosy apple aphid nor APPLE APHID (Aphis pomi) were conspicuous in commercial orchards of RHODE ISLAND. The greatest populations were found on sucker growth of neglected trees. Apple aphid numbers were down slightly from past years in CONNECTICUT. Rosy apple aphid, apple aphid and APPLE GRAIN APHID (Rhopalosiphum fitchii) were not problems in well-sprayed orchards in NEW YORK but could be readily found in abandoned or unsprayed trees. These same three aphids were abundant quite early in PENNSYLVANIA. Apple aphid was general in a number of OHIO orchards although injurious only in a few instances. Large numbers of apple aphid were noted in 2 orchards in northeastern Ohio in late summer and occasional instances of rather serious damage by rosy apple aphid were observed over the State. Rosy apple aphid and apple aphid could be found in most locations in NEW JERSEY, but they were well controlled by the recommended materials. Rosy apple aphid developed unnoticed in ILLINOIS so that populations appeared in mid-May in the south where controls were required. Egg counts of apple aphid were low in Illinois and this aphid gave little difficulty. Apple grain aphid was troublesome in some areas of MINNESOTA. Rosy apple aphid infestations were very local in CALIFORNIA, but GREEN PEACH APHID (Myzus persicae) damaged deciduous trees generally and persisted for a longer period than usual in that State.

SAN JOSE SCALE (Aspidiotus perniciosus) was one of the predominant scale insect pests of fruit in ALABAMA. In GEORGIA, the phosphate sprays used during the growing season are keeping this armored scale under control; therefore, it has not been present in most commercial orchards where the recommended spray has been used. San Jose scale seems to be building up in the tops of large trees in a few scattered blocks throughout NEW YORK; this can be attributed generally to poor spray coverage. A few orchards in INDIANA have reported persistent populations of San Jose scale which appear to be resistant to many of the currently recommended control procedures. Damage to fruit trees in northern counties of NEW MEXICO continued where this scale insect was not controlled. San Jose scale was found at 2 locations in COLORADO on abandoned trees; none were found in any commercial plantings. Infestations continued statewide on deciduous fruit trees in CALIFORNIA.

Other coccids reported on fruit included: APPLE MEALYBUG (Phenococcus aceris) in MAINE where heavy infestations in South Bridgton, Cumberland County, in mid-June and Wilton, Franklin County, in late June were noted. The South Bridgton population was moderately parasitized by an unidentified encyrtid wasp. Crawlers of OYSTERSHELL SCALE (Lepidosaphes ulmi) were active in Maine on May 22 in Turner, Androscoggin County, and on May 29 in Sidney, Kennebec County. Oystershell scale seems to be building up in the tops of large trees in a few blocks at scattered locations in NEW YORK. WHITE PEACH SCALE (Pseudaulacaspis pentagona) was one of the more predominant scale insects on fruit in ALABAMA. Hatch of EUROPEAN FRUIT LECANIUM (Lecanium corni) occurred during the week ending June 26 in Ingham County, MICHIGAN, but few fruit plantings were troubled by this soft scale. European fruit lecanium was found at 2 locations in COLORADO in abandoned trees; none was found in any commercial plantings. Widespread, local infestations of OLIVE SCALE (Parlatoria oleae) occurred in many CALIFORNIA counties on deciduous and other fruit trees.

TARNISHED PLANT BUG (Lygus lineolaris) adult activity and damage were higher than normal in MAINE following a sudden warm spell in May and Lygus spp. were found on fruits in MISSOURI.

Brood IV PERIODICAL CICADAS (Magicicada spp.) were active in MISSOURI from May 25 to July 3 with 3 species, M. septendecim, M. septendecula and M. cassini being taken. This is the first time M. septendecim has been taken in Missouri with Brood IV. Another CICADA (Diceroprocta apache) caused severe damage to many fruit trees during the summer in most areas of ARIZONA.

PLUM CURCULIO (Conotrachelus nenuphar) populations and damage were light in Sanford and Alfred, York County, MAINE. Only in locations where poor or no control measures were taken did this weevil cause other than negligible damage in Maine. First adults of the season were collected in Kingston, Washington County, RHODE ISLAND, on May 22 with adult abundance occurring about the first of June. Observations and reports indicated moderate populations and short periods of adult activity occurred in Rhode Island in 1964. In CONNECTICUT, activity extended over a longer than usual period because of alternating cool and hot weather which made control more difficult and damage was slightly higher than usual. Plum curculio was difficult to find in well-sprayed commercial orchards of NEW JERSEY; however, it was plentiful in unsprayed trees.

Plum curculio damage in MINNESOTA was not very extensive in 1964 because of low populations. Adults appeared in WISCONSIN on May 7 and reports incicated a higher than normal incidence. Plum curculio was not so damaging in 1964 in INDIANA as in the previous 2 years; however, there were several instances of commercial injury. This weevil caused some damage in MISSOURI in a few poorly managed orchards in west central and southeastern areas. Plum curculio was noted in OKLAHOMA in 1964.

Other beetles attacking fruit trees included SHOT-HOLE BORER (Scolytus rugulosus) which was present in devitalized, weak or diseased trees in neglected orchards of GEORGIA as usual, and PACIFIC FLATHEADED BORER (Chrysobothris mali) which was more damaging than usual in CALIFORNIA to deciduous fruit trees.

NUT CROP INSECTS

Highlights:

Because of a small crop of pecans in Georgia and Alabama, losses caused by PECAN NUT CASEBEARER and PECAN LEAF CASEBEARER were more noticeable. FILBERT APHID was very heavy in part of Washington State and BLACK PECAN APHID was serious again in Alabama. WALNUT HUSK FLY is now a pest of major consequence in California's walnut crop.

PECAN NUT CASEBEARER (Acrobasis caryae) was extremely heavy and inflicted more damage in ALABAMA than in 1963 inasmuch as a small crop was set in 1964. As much as 50 percent of the crop in untreated groves in Plaquemines Parish, LOUISIANA, was destroyed. Heavy, widespread infestations occurred in the southern pecan-growing areas of TEXAS, but infestations were generally less severe in central and northern areas. Damage was light to moderate throughout the pecan-producing areas of OKLAHOMA from early May to mid-July. Second-generation egg laying began in mid-July but damage was light. Surveys in NEW MEXICO indicate that this phycitid moth is still confined to the Carlsbad area in Eddy County. Neither insects nor damage was noted in other areas checked in the Pecos Valley and in the Mesilla Valley of Dona Ana County. Pecan nut casebearer and PECAN LEAF CASEBEARER (Acrobasis juglandis) caused light defoliation to pecan trees as they began to bud in south GEORGIA about April 1. First adults were trapped May 2. Light to moderate infestations of pecan nut casebearer occurred on the small nuts; this is more serious in a year when the crop is small. NAVEL ORANGEWORM (Paramyelois transitella) was a pest of almonds statewide in CALIFORNIA.

HICKORY SHUCKWORM (Laspeyresia caryana) adults emerged in southern GEORGIA on June 9 and infestations were light to moderate later in the season. This notodontid moth was extremely heavy and inflicted more damage in ALABAMA than in 1963 and was generally present in the Guadalupe County area of TEXAS. ORIENTAL FRUIT MOTH (Grapholitha molesta) was a serious pest of almonds and CODLING MOTH (Carpocapsa pomonella) continued as a problem on walnuts and almonds in CALIFORNIA.

Other lepidopterous pests of nuts included an unspecified NEPTICULID MOTH which caused considerable defoliation of pecan leaves in local areas of northern TEXAS. FALL WEBWORM (Hyphantria cunea) was heavy on pecans in the southern half of LOUISIANA and caused noticeable injury during the latter part of the season throughout the State. Leaf feeding by fall webworm larvae was also observed in NORTH DAKOTA. TENT CATERPILLARS (Malacosoma spp.) damaged walnuts in a few CALIFORNIA locations and RED-HUMPED CATERPILLAR (Schizura concinna) damaged walnuts locally in the northern part of the State.

FILBERT APHID (Myzocallis coryli) infestations were heavy in Clark County, WASHINGTON, in early July. In NEW MEXICO, Myzocallis caryaefoliae was a problem on pecan trees in the Mesilla Valley of Dona Ana County and in the Pecos Valley during June and July. BLACK-MARGINED APHID (Monellia costalis) was also a problem in these same areas at the same time. Treatments were required in some areas for these 2 aphids. Black-margined aphid was abundant in UTAH where it made pecan foliage sticky at Hurricane, St. George and Santa Clara in Washington County in the spring. Light infestations of BLACK PECAN APHID (Melanocallis caryaefoliae) appeared on pecan trees in the north central portions of TEXAS in late fall. Pecan growers of ALABAMA experienced another serious infestation of black pecan aphid during 1964 when many orchards were defoliated before maturity of the nuts.

SAN JOSE SCALE (Aspidiotus perniciosus) infestations continued for most of the year on almonds and OLIVE SCALE (Parlatoria oleae) was widespread on almonds in CALIFORNIA. ITALIAN PEAR SCALE (Epidiaspis piricola) infested walnut trees locally in San Joaquin and Santa Clara Counties, California. Heavy numbers of OBSCURE SCALE (Chrysomphalus obscurus) occurred on pecans in Comanche and Brazos Counties of TEXAS. PLANT BUGS were noted in many GEORGIA pecan orchards.

WALNUT HUSK FLY (Rhagoletis completa) is now a pest of major consequence to walnuts statewide in CALIFORNIA. Dooryard and street trees as well as commercial acreages suffered high losses of fruit during 1964. Walnut husk fly numbers and damage were approximately normal in UTAH. Damage to walnut husks in Washington County, TEXAS, was probably caused by this fruit fly. Adult catches of a related fly, R. suavis, on sticky boards in OHIO were reduced in areas that had a complete freezeout of the black walnut crop in 1963; in other areas of the State, the catch was normal.

PECAN WEEVIL (Curculio caryae) populations were heavy in north central TEXAS following showers. Heavy damage was inflicted to pecans in some areas of OKLAHOMA when this weevil became active in late August.

A SPIDER MITE (Eotetranychus hicoriae) caused scorching of pecan foliage in some areas of southern GEORGIA and SPIDER MITES caused heavy damage to pecan orchards in ALABAMA during unseasonably dry periods. EUROPEAN RED MITE (Panonychus ulmi) was a pest of walnuts, almonds and other trees in many locations of CALIFORNIA and a FRUIT-TREE MITE (Bryobia rubrioculus) required treatment on almonds in the mid-San Joaquin Valley.

Several species of SAWFLIES were reported damaging pecans in a wide area of TEXAS.

In FLORIDA, several nut crop insects were of concern. PECAN NUT CASEBEARER (Acrobasis caryae) infestations were moderate to heavy statewide; damage was heavy throughout northern Florida due to a light crop. PECAN LEAF CASEBEARER (A. juglandis) damage was very light in the Monticello area. HICKORY SHUCKWORM (Laspeyresia caryana) infestations were heavy and damage was more evident than usual due to light crop. More than 75 percent of the shucks were infested on some varieties where controls were not applied. PECAN BUD MOTH (Gretchena bolliana) infestations were heavy in pecan nurseries and locally heavy in pecan orchards. FALL WEBWORM (Hyphantria cunea) was light to moderate on peaches throughout the northern area. A WEEVIL (Conotrachelus aratus) was light to moderate in a small home pecan nursery but light on bearing trees in adjacent orchard. Larvae of another WEEVIL (C. anagylypticus) caused moderate damage by killing newly placed patch buds under tape on pecan nursery trees during August and September. PECAN SPITTLEBUG (Clastoptera achatina) was heavy on pecans during April and again in July and August. An APHID (Monellia sp.) was quite abundant in early spring and again in late August and September. BLACK PECAN APHID (Melanocallis caryaefoliae) was light to moderate locally on some pecan orchards and was more severe on some varieties around homes.

GRAPE INSECTS

WESTERN GRAPE LEAF SKELETONIZER (Harrisina brillians) is subjected to an eradication program in parts of CALIFORNIA. Late in the 1964 season a small, local infestation was discovered in the city of Fresno, Fresno County. The first eradication treatments were applied and no larval infestations occurred. Inspections in Kerman, Fresno County, and Livermore, Alameda County, were negative in 1964. The infestation in Fresno was composed of individuals of both red and black "collars" as compared with the Kerman and Livermore infestations where only "red-collared" adults occurred. Western grape leaf skeletonizer was a pest of grapes locally in San Diego County, California. This leaf skeletonizer moth spread from cultivated to wild grapes in Clark County, NEVADA. Larvae first appeared in May in Las Vegas and North Las Vegas in that county and caused heavy damage as the season progressed. It also spread to native grapes in the southern Spring Mountains of Clark County. In UTAH, western grape leaf skeletonizer was more damaging in late summer than it had been for several years in Washington County. A closely related species, Harrisina metallica, collected on grapevines at Albuquerque, NEW MEXICO, in mid-August, was a new State record.

GRAPE BERRY MOTH (Paralobesia viteana) caused little difficulty on grapes in NEW YORK but it was noted in unsprayed vineyards. This olethreutid moth was of no economic importance in vineyards of OHIO which received moderate spray applications. Egg laying and larval activity were underway in southwestern MICHIGAN by May 18 and second-brood emergence started in late August. This pest was found on fruits in MISSOURI; was light in ARKANSAS and was about normal in UTAH during the 1964 season.

GRAPE ROOT BORER (Vitacea polistiformis) populations were reduced for the first time in 5 years in MISSOURI, but were active from July 14 to August 20, and the pest continued active in northwest ARKANSAS.

LEAFHOPPERS were near normal in numbers on grapes in NEW YORK but there were no reports of failures of controls when recommended spray practices were followed. Varied populations of Erythroneura sp. created considerable damage in CALIFORNIA from San Bernardino County to Napa County.

A WEEVIL (Ampeloglypter ater) appeared in trace numbers in isolated vineyards of OHIO where it had been frozen in 1963. In ARIZONA, scattered, heavy populations of GRAPE FLEA BEETLE (Altica chalybea) damaged grapes in Maricopa and Pinal Counties during April, but controls were generally effective.

VINEGAR FLIES (Drosophila spp.) were probably the most important problem in NEW YORK for growers and processors of grapes. A CECIDOMYIID MIDGE (Lasioptera vitis) caused extensive damage to grapevines in VIRGINIA.

PACIFIC SPIDER MITE (Tetranychus pacificus) and Eotetranychus willamettei were pests on grapes locally in CALIFORNIA. Tetranychus mcdanieli damaged grapes in the lower Yakima Valley of WASHINGTON. This was a first record on this host. EUROPEAN RED MITE (Panonychus ulmi) infestations were spotty and isolated on a few Concord grape vineyards of OHIO.

BLUEBERRY, CRANBERRY AND CURRANT INSECTS

CRANBERRY GIRDLER (Crambus topiarius) was extremely abundant throughout the cranberry-growing area of MASSACHUSETTS and caused considerable vine killing. BLACK-HEADED FIREWORM (Rhopobota naevana) damaged several cranberry bogs in the Wareham area of Massachusetts, although less abundant than usual. Adults of black-headed fireworm were numerous in untreated cranberry bogs in Pacific County, WASHINGTON, in mid-July. A BLUEBERRY TIP BORER (Hendecaneura shawiana) was prevalent in unsprayed plantings in OHIO. Larval injury by DOGWOOD BORER (Thamnosphecia scitula) to blueberries was reported from MICHIGAN in several Van Buren and Ottawa County plantings. Adult emergence began in these areas in late June and early July. Caterpillars of GYPSY MOTH (Porthetria dispar) were abundant in some MASSACHUSETTS cranberry bogs in the Cape Cod area early in the season, and built up to outbreak proportions in some instances later in the season.

BLUEBERRY MAGGOT (Rhagoletis mendax) emergence in Jonesboro, Washington County, MAINE, began in cages on June 23, peaked on June 28, and ended July 17. Populations in Maine were average to somewhat below average in most areas. Blueberry maggot was more prevalent in MASSACHUSETTS than it had been in the last several years. A maggot, assumed to be blueberry maggot, occurred in a single planting of blueberries and in sufficient numbers to cause economic loss. CURRANT FRUIT FLY (Epochra canadensis) numbers and damage were approximately normal in UTAH during the 1964 season. Infestations and injury caused by a CECIDOMYIID MIDGE (Contarina vaccinii) were observed in Jonesboro, MAINE, in July. Maggots, about two-thirds grown at that time, indicated hatch occurred about June 20-25.

BLUEBERRY THRIPS (Frankliniella vaccinii) infestations and injury were moderate in MAINE at Jonesport and Jonesboro, Washington County, with light to moderate infestations and light injury noted in the Franklin area of Hancock County in mid-June.

CRANBERRY WEEVIL (Anthonomus musculus) was more abundant in MASSACHUSETTS than it has been for the past several years with some injury noted in Plymouth County bogs.

IMPORTED CURRANTWORM (Nematus ribesii) was reported in isolated instances on currant and gooseberry plants over NORTH DAKOTA and CURRANT APHID (Capitophorus ribis) caused approximately normal damage in UTAH.

CITRUS INSECTS

Highlights:

YELLOW SCALE, GLOVER SCALE, CHAFF SCALE, Unaspis citri, Pinnaspis strachani and WHITEFLIES broke population records of 13 years standing in Florida groves. CITRUS MEALYBUG was also at record high level in that State, but CITRUS RED MITE and BROWN SOFT SCALE reached the lowest fall level of 14 years of record. Biological controls are important factors for BLACK SCALE in California and for COTTONY-CUSHION SCALE in California and Arizona. No resistance to chemical controls was reported in any of the citrus-producing States, but controls were necessary to produce quality fruit. CITRUS RUST MITE continued its spread in Arizona lemon blocks and it is of considerable concern in that State and in California.

BLACK SCALE (Saissetia oleae) was widespread on citrus trees in CALIFORNIA, where biological control plays an important role in control. In FLORIDA citrus groves, black scale was above average during the first half of the year, and reached a level of economic importance over much of the State during July and August. Black scale was above normal but noneconomic in Florida's groves for the remainder of the year. BROWN SOFT SCALE (Coccus hesperidum) was below normal abundance in Florida groves in January through March and at the lowest fall level of 14 years of record. CITRICOLA SCALE (C. pseudomagnoliarum) was reported on California citrus from Tulare County northward. This soft scale was reported more than it had been in past years in California. PYRIFORM SCALE (Protopulvinaria pyriformis) was below normal abundance in Florida groves in the first and last quarters of 1964 and FLORIDA WAX SCALE (Ceroplastes floridensis) was below normal in that State in October through the end of 1964.

CALIFORNIA RED SCALE (Aonidiella aurantii) was primarily a major pest of citrus in southern CALIFORNIA but it now has become a pest in many localities statewide. YELLOW SCALE (Aonidiella citrina) continued as a general pest of citrus in Tulare County, California, and locally in San Joaquin County. Abnormally high levels occurred in FLORIDA groves in January through March and reached the highest monthly population level of 13 years of record in April. Yellow scale was above average through June and was important in localized areas from July through September. Yellow scale was the second most abundant scale insect in Florida groves during the last quarter of 1964.

DICTYOSPERMUM SCALE (Chrysomphalus dictyospermi) was at an abnormally high level in FLORIDA citrus groves in the first quarter of the year; it continued at above normal levels for the remainder of the year but it did not reach destructive levels. FLORIDA RED SCALE (C. aonidum) was below normal in Florida citrus groves. GLOVER SCALE (Lepidosaphes gloverii) was at abnormally high levels during the first part of the year in Florida and reached the highest monthly population level of 13 years of record in June. Glover scale was at economic levels in July and August but did not persist into September. This armored scale was the most abundant scale insect in Florida groves in October through December, being moderate to heavy in 25 percent of the groves. CHAFF SCALE (Parlatoria pergandii) reached its highest monthly population record of 13 years in April after having been at abnormally high levels earlier in Florida groves. Chaff scale was of economic importance through August but it did not continue in the high range in

September. Chaff scale was above normal in Florida citrus groves in the last quarter of the year. Two other ARMORED SCALES, Unaspis citri and Pinnaspis strachani, reached highest monthly levels of 13 years of record in May and June, respectively. Both were above average abundance during the year but only U. citri was important in localized areas in July to September.

MEALYBUGS were above average abundance the first half of 1964 in FLORIDA. There was a phenomenally rapid increase of CITRUS MEALYBUG (Pseudococcus citri) from below normal level in late April to a record high level at the end of June in Florida groves. Moderate to heavy infestations were found in 49 percent of the groves at that time. Mealybugs reached economic levels over much of Florida in July and August and misshapened grapefruit resulted from heavy infestations. COTTONY-CUSHION SCALE (Icerya purchasi) was above normal in Florida groves but it was of little importance in the last half of the year. Active infestations of cottony-cushion scale appeared on ARIZONA citrus in Maricopa, Pinal and Yuma Counties during June and again in the fall months. Predators were highly successful in controlling this mealybug in Arizona. Several local infestations of cottony-cushion scale occurred on citrus in dooryard plantings in CALIFORNIA. These infestations served as reservoirs for Rodolia cardinalis (vedalia).

CITRUS WHITEFLY (Dialeurodes citri) developed moderate to heavy infestations on untreated citrus in Plaquemines and St. Bernard Parishes, LOUISIANA. Record high larval populations of WHITEFLIES persisted through March in FLORIDA citrus groves. Moderate to heavy infestations were found in 34 percent of the groves at that time. CLOUDY-WINGED WHITEFLY (D. citrifolii) was the most abundant species. Adult whiteflies began to appear in above normal numbers in late March, reaching the highest monthly level in 13 years of record in May and continued in high range into September. The prolonged high populations contributed to abnormally heavy growths of sooty mold. Whiteflies were above normal in October and again in December in Florida groves.

APHIDS were above normal in FLORIDA through April, below average in May and normal in June on citrus. GREEN PEACH APHID (Myzus persicae) caused general damage to CALIFORNIA citrus and persisted for a longer period than usual.

CITRUS RED MITE (Panonychus citri) was a serious pest statewide in CALIFORNIA but greater damage occurred on southern area citrus. Moderate to heavy infestations developed on untreated citrus in LOUISIANA in Plaquemines and St. Bernard Parishes. Citrus red mite was scattered in FLORIDA groves through March, below normal abundance later and dropped to the lowest statewide population level recorded in 14 years. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) was also very low in Florida citrus groves and remained near the record low set in 1963. Six-spotted mite was a light problem on California citrus in Santa Barbara County. TEXAS CITRUS MITE (Eutetranychus banksi) populations were higher for the first quarter of the year in Florida than in other years. It was above normal but moderate and reached economic numbers over much of the State in July and August. Numbers were economic in 17 percent of Florida's groves by late November compared with 13 percent which is normal for that period. YUMA SPIDER MITE (Eotetranychus yumensis) was scattered in ARIZONA but required controls in Yuma County. In general, controls were effective in Arizona.

CITRUS RUST MITE (Phyllocoptruta oleivora) was a problem on citrus in CALIFORNIA in Santa Barbara, San Diego and western Riverside Counties much of the year. The first infestation of this eriophyid mite in ARIZONA was found on lemons in Yuma County in 1963. Since then, at least 6 properties have been infested, all lemon blocks. Proper control methods have been effective in most instances. The rapid spread of citrus rust mite in Arizona may be of much concern to citrus growers in the future. Only scattered infestations occurred on FLORIDA groves during the early part of the year. Citrus rust mite was far below normal on both leaves and fruit in April through June and subnormal through September. At the October peak, 51 percent of Florida's groves harbored moderate to heavy infestations of citrus rust mite. CITRUS BUD MITE (Aceria sheldoni) required considerable control on lemons in San Diego and Santa Barbara Counties, California.

CITRUS FLAT MITE (Brevipalpus lewisi) was medium to heavy in ARIZONA and required controls in Yuma County and areas of Maricopa County throughout the year. Tangerines appeared to have been damaged more severely.

ORANGE TORTRIX (Argyrotaenia citrana) was a widespread pest of CALIFORNIA citrus fruit but it was not so severe as in past years. FRUIT-TREE LEAF ROLLER (Archips argyrospilus) was locally damaging to citrus in several widely separated areas of California and WESTERN TUSSOCK MOTH (Hemerocampa vetusta) damaged citrus in a few locations. ORANGE-DOG (Papilio cresphontes) developed moderate to heavy infestations on untreated citrus in LOUISIANA in Plaquemines and St. Bernard Parishes. Papilio spp. populations increased over those of 1963 in ARIZONA and caused concern to many citrus growers. The heaviest infestations occurred during September and October in Maricopa, Pima and Yuma Counties.

CITRUS THRIPS (Scirtothrips citri) caused moderate to heavy damage to citrus in ARIZONA during the early fruit set in most areas of Yuma, Maricopa and Pinal Counties. Controls were necessary in that State to protect the quality of fruit. Citrus thrips was a considerable problem on citrus in CALIFORNIA from Tulare County southward. Control problems continued from April through September.

A SCARAB (Anomala sp.) severely ragged citrus leaves in Hidalgo County, TEXAS, but KATYDIDS caused only light problems on citrus in Los Angeles and Riverside Counties, CALIFORNIA.

OLIVE, AVOCADO AND FIG INSECTS

BLACK SCALE (Saissetia oleae) was widespread on olive trees in CALIFORNIA and PARLATORIA SCALE (Parlatoria oleae) was widespread locally in many counties on olive and other hosts.

GREENHOUSE THRIPS (Heliothrips haemorrhoidalis) infested avocados in San Diego and Santa Barbara Counties, CALIFORNIA; some biological control was evident. Considerable biological control helped keep AVOCADO BROWN MITE (Oligonychus punicae) under control in California. This spider mite occurred in all avocado-growing areas.

A SCARAB (Cotinis texana) was a problem locally on ripening figs in Los Angeles, Riverside and San Diego Counties, CALIFORNIA.

Additional Fruit Notes From Florida

A PINK CITRUS RUST MITE (Aculus pelekassi) is now generally distributed over the citrus belt and it is now treated in the same manner as any other common citrus pest. Nurseries are no longer quarantined unless this eriophyid's population reaches a level of economic importance. The first and only collection in the United States of a SUGARCANE ROOTSTALK BORER (Diaprepes abbreviata) was made in an Orange County citrus nursery September 25, 1964. No more than that one specimen was ever found. CITRUS RED MITE (Panonychus citri), CITRUS RUST MITE (Phyllocoptruta oleivora) and BROAD MITE (Hemitarsonemus latus) were the most important pests attacking limes in the Homestead area of Dade County. MITES reddened some avocado leaves in the Homestead area but no more than usual. SCALE INSECTS were probably less abundant than usual on avocados.

PAPAYA FRUIT FLY (Toxotrypana curvicauda) was prevalent as usual on papaya. COTTON LACE BUG (Corythucha gossypii) caused moderate damage during the summer and early fall on Ceylon peach in the Miami area and PEACH TREE BORER (Sanninoidea exitiosa) was light to moderate in peach orchards of northern Florida, but kept under control very well where recommended spray programs were used. PLUM CURCULIO (Conotrachelus nenuphar) caused light injury in northern peach orchards but damage in unsprayed home plantings was heavy. WHITE PEACH SCALE (Pseudaulacaspis pentagona) was an actual or potential problem from Orlando-Leesburg area northward in peach orchards. Summer sprays were only partially effective in controlling this pest. Oil sprays will be essential. SAN JOSE SCALE (Aspidiotus perniciosus) continued as a problem in northern and northwestern peach orchards. A CUBAN MAY BEETLE (Phyllophaga bruneri) defoliated some lychee trees in home plantings in the Miami area.

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